Volumetric and Sedimentation Survey of LAKE TYLER

January 2013 Survey

Texas Water Development Board

September 2013

Texas Water Development Board

Prepared for:

City of Tyler

With Support Provided by:

U.S. Army Corps of Engineers, Fort Worth District

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Published and distributed by the

Texas Water Development Board

P.O. Box 13231, Austin, TX 78711-3231

Executive summary

In September, 2012, the Texas Water Development Board entered into agreement with the U.S. Army Corps of Engineers, Fort Worth District, to perform a volumetric and sedimentation survey of Lake Tyler. The U.S. Army Corps of Engineers, Fort Worth District, provided 50% of the funding for this survey through their Planning Assistance to States Program, while the City of Tyler, Texas provided the remaining 50%. Surveying was performed using a multi-frequency (200 kHz, 50 kHz, and 24 kHz), sub-bottom profiling depth sounder. In addition, sediment core samples were collected in select locations and correlated with the multi-frequency depth sounder signal returns to estimate sediment accumulation thicknesses and sedimentation rates.

The reservoir designated today as Lake Tyler was created by joining two reservoirs by canal. Whitehouse Dam impounds the original Lake Tyler and Mud Creek Dam impounds the original Lake Tyler East. Whitehouse Dam and Mud Creek Dam are located on Prairie Creek and Mud Creek in Smith County, approximately 12.0 miles southeast of Tyler, Texas, respectively. The conservation pool elevation of Lake Tyler is 375.38 feet above mean sea level (NGVD29). TWDB collected bathymetric data for Lake Tyler between January 18, 2013, and January 23, 2013. The daily average water surface elevations during the survey averaged 371.16 feet above mean sea level for each day Additional survey data was collected around the intake structure on August 15, 2013, while the daily average water surface elevation measured 370.8 feet above mean sea level.

The 2013 TWDB volumetric and sedimentation survey indicates that Lake Tyler has a total reservoir capacity of 77,284 acre-feet and encompasses 4,714 acres at conservation pool elevation (375.38 feet above mean sea level, NGVD29). In 1966-67, the U.S. Geological Survey calculated an estimate capacity of 80,900 acre-feet encompassing 4,880 acres. The TWDB volumetric survey conducted in 1997 was re-evaluated using current processing procedures that resulted in updated capacity estimates of 83,244 acre-feet.

Based on two methods for estimating sedimentation rates, the 2013 TWDB sedimentation survey estimates Lake Tyler loses between 80 and 373 acre-feet of capacity per year due to sedimentation below conservation pool elevation (375.38 feet above mean sea level, NGVD29). The sedimentation survey indicates sediment accumulation varies throughout the reservoir. Accumulation within Hill Creek of Lake Tyler West becomes heavier as it approaches Gilley Creek. The heaviest accumulations measured are between 0.2 and 1.0 miles northwest of Whitehouse Dam. TWDB recommends that a similar methodology be used to resurvey Lake Tyler in 10 years or after a major flood event.

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Note: References to brand names throughout this report do not imply endorsement by the Texas Water Development Board

Introduction

The Hydrographic Survey Program of the Texas Water Development Board (TWDB) was authorized by the 72nd Texas State Legislature in 1991. The Texas Water Code authorizes TWDB to perform surveys to determine reservoir storage capacity, sedimentation levels, rates of sedimentation, and projected water supply availability.

In September, 2012, the Texas Water Development Board entered into agreement with the U.S. Army Corps of Engineers, Fort Worth District to perform a volumetric and sedimentation survey of Lake Tyler (TWDB, 2012). The U.S. Army Corps of Engineers, Fort Worth District, provided 50% of the funding for this survey through their Planning Assistance to States Program, while the City of Tyler, Texas provided the remaining 50%. This report describes the methods used to conduct the volumetric and sedimentation survey, including data collection and processing techniques. This report serves as the final contract deliverable from TWDB to the City of Tyler and the U.S. Army Corps of Engineers, Fort Worth District, and contains as deliverables: (1) an elevation-area-capacity table of the reservoir acceptable to the Texas Commission on Environmental Quality [Appendix A, B], (2) a bottom contour map [Figure 6], (3) a shaded relief plot of the reservoir bottom [Figure 4], and (4) an estimate of sediment accumulation and location [Figure 10].

Lake Tyler general information

Lake Tyler was originally two reservoirs. The original Lake Tyler was impounded on January 8, 1949, with the construction of Whitehouse Dam. Whitehouse Dam is located on Prairie Creek in Smith County, approximately 12 miles southeast of the City of Tyler, Texas (Figure 1). Construction of Whitehouse Dam began on April 30, 1948, and was completed on May 13, 1949. The original Lake Tyler East was impounded on November 22, 1966, with the construction of Mud Creek Dam. Mud Creek Dam is located on Mud Creek just east of Whitehouse Dam (Figure 1). Construction of Mud Creek Dam began on February 11, 1966, and was completed in January 1967. A canal connecting the two reservoirs was completed on May 29, 1968.

Lake Tyler is owned and operated by the City of Tyler, Texas (TWDB, 1973). Lake Tyler is primarily a water supply reservoir for the City of Tyler, providing just less than half the water Tyler uses for beneficial purposes including municipal and industrial uses. The rest of the water used by Tyler comes from Lake Palestine, with up to 10 percent of the water supply coming from wells located throughout the city (COT, 2012).

Additional pertinent data about Whitehouse and Mud Creek Dams and Lake Tyler can be found in Table 1.

Water rights for Lake Tyler have been appropriated to the City of Tyler through Certificate of Adjudication No. 06-4853. The complete certificate is on file in the Information Resources Division of the Texas Commission on Environmental Quality.

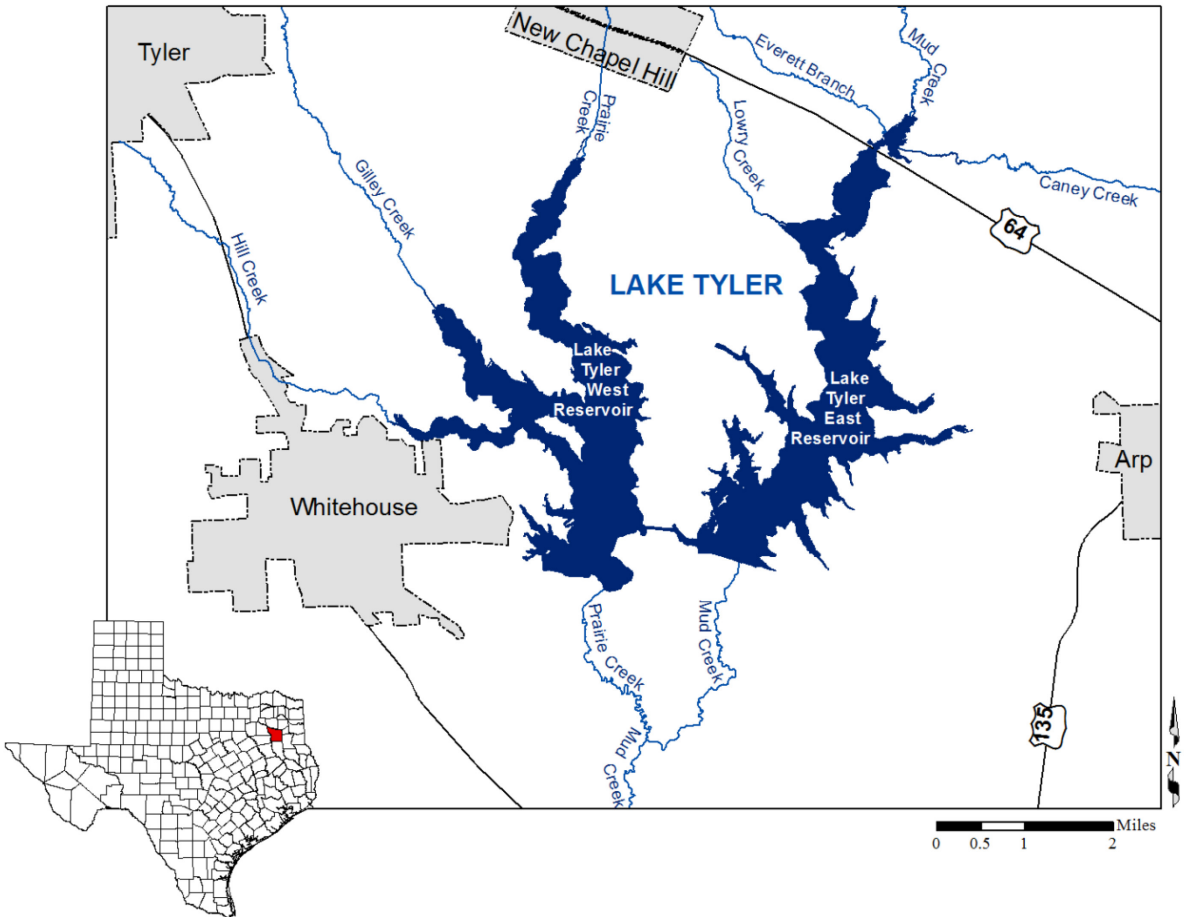


Figure 1. Location of Lake Tyler

Table 1. Pertinent data for Whitehouse and Mud Creek Dams and Lake Tyler

Whitehouse Dam

Owner
City of Tyler

Engineer (design)
T.C. Forrest (Now Forrest and Cotton, Inc.)

General contractor
Caruth Construction Company

Location of dam
On Prairie Creek in Smith County, approximately12 miles southeast of Tyler, Texas.

Drainage area
45 square miles

Dam

Type	Earthfill
Length	4,708 feet
Maximum height	50 feet±
Width	20 feet±

Spillway (service)

Type	Concrete chute
Crest control	None
Crest elevation	375.38 feet above mean sea level
Crest length	200 feet

Outlet works (city pumping plant)

Type	Intake tower 2 miles upstream
Control	3 sluice gates
Invert of middle sluice gate	356.0 feet above mean sea level
Low invert elevation/ Gate intake tower	350.0 feet above mean sea level

Mud Creek Dam

Owner
City of Tyler

Engineer (design)
Wisenbaker, Fix, and Associates

General contractor
Vilbig Construction Company

Location of dam
On Mud Creek in Smith County, approximately12 miles southeast of Tyler, Texas.

Drainage area
62 square miles

Dam

Type	Earthfill
Length	4,700 feet
Maximum height	50 feet
Width	20 feet
Top elevation	390 to 391.5 feet above mean sea level

Spillway

Type	Concrete weir
Crest control	None
Crest elevation	375.38 feet above mean sea level
Crest length	300 feet

Outlet works (at the dam)

Type	Inlet box and concrete pipe, 18-inch diameter
Invert of upper sluice gate	362.0 feet above mean sea level
Top of box elevation/ Invert low outlet	350.0 feet above mean sea level
Control	Slide valve

Table 1 (Continued). Pertinent data for Whitehouse and Mud Creek Dams and Lake Tyler

Reservoir data (Combined capacities based on 2013 TWDB survey)

Feature	Elevation (feet NGVD29[a])	Capacity (acre-feet)	Area (acres)
Top of dam	390.0 to 391.5	N/A	N/A
Crest of spillway	375.38	77,284	4,714
Invert low outlet	350.0	5,211	1,092
Usable conservation storage space[b]	-	72,073	-

Source: (TWDB1973, TWDB 1997)

[a] NGVD29 = National Geodetic Vertical Datum 1929

[b] Usable conservation storage space equals total capacity at conservation pool elevation minus dead pool capacity. Dead pool refers to water that cannot be drained by gravity through a dam's outlet works.

Volumetric and sedimentation survey of Lake Tyler

Datum

The vertical datum used during this survey is the National Geodetic Vertical Datum 1929 (NGVD29). This datum is also utilized by the United States Geological Survey (USGS) for the reservoir elevation gage *USGS 08034000 Lk Tyler nr Whitehouse, TX* (USGS, 2013). Elevations herein are reported in feet relative to the NGVD29 datum. Volume and area calculations in this report are referenced to water levels provided by the USGS gage. The horizontal datum used for this report is North American Datum 1983 (NAD83), and the horizontal coordinate system is State Plane Texas North Central Zone (feet).

TWDB bathymetric and sedimentation data collection

TWDB collected bathymetric data for Lake Tyler between January 18, 2013, and January 23, 2013. The daily average water surface elevations during the survey averaged 371.16 feet above mean sea level for each day. Additional survey data was collected around the intake structure on August 15, 2013, while the daily average water surface elevation measured 370.8 feet above mean sea level. For data collection, TWDB used a Specialty Devices, Inc. (SDI), single-beam, multi-frequency (200 kHz, 50 kHz, and 24 kHz) sub-bottom profiling depth sounder integrated with differential global positioning system (DGPS) equipment. Data collection occurred while navigating along pre-planned survey lines oriented perpendicular to the assumed location of the original river channels and spaced approximately 500 feet apart. Many of the survey lines were also surveyed by TWDB during the 1997 survey. The depth sounder was calibrated daily using a velocity profiler to measure the speed of sound in the water column and a weighted tape or stadia rod for depth reading verification. Figure 2 shows where data collection occurred during the 2013 TWDB survey.

All sounding data was collected and reviewed before sediment core sampling sites were selected. Sediment core samples are collected at regularly spaced intervals within the reservoir, or at locations where interpretation of the acoustic display would be difficult without site-specific sediment core data. Following the analysis of the sounding data, TWDB selected seven locations to collect sediment core samples (Figure 2). The sediment core samples were collected on July 2, 2013, with a custom-coring boat and SDI VibeCore system.

Sediment cores are collected in 3-inch diameter aluminum tubes. Analysis of the acoustic data collected during the bathymetric survey assists in determining the depth to which the tube must be driven during sediment sampling. The goal is to collect a sediment core sample extending from the current reservoir-bottom, through the accumulated sediment, and to the pre-impoundment surface. After retrieving the sample, a stadia rod is inserted into the top of the tube to assist in locating the top of the sediment in the tube. This identifies the location of the layer corresponding to the current reservoir surface. The aluminum tube is cut to this level, capped, and transported back to TWDB headquarters for further analysis. During this time, some settling of the upper layer can occur.

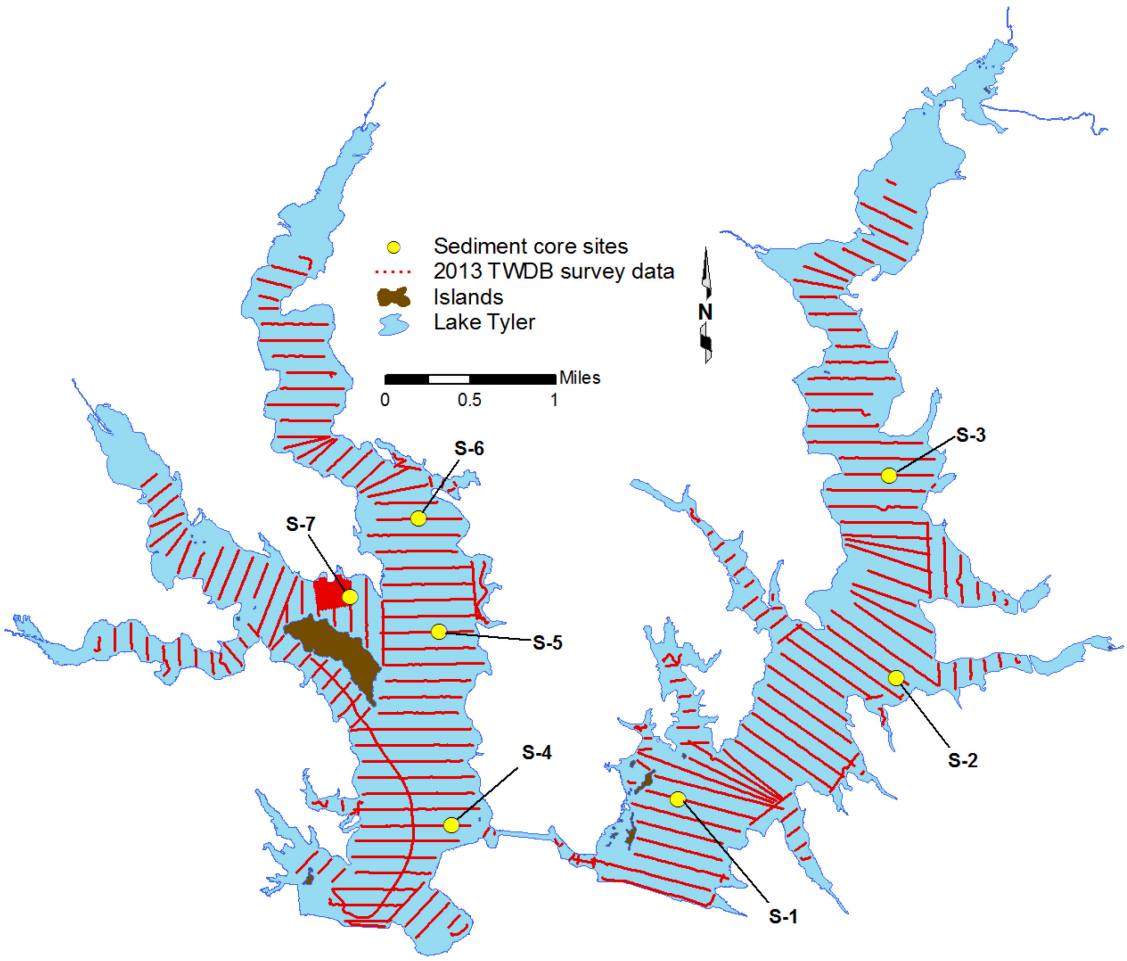


Figure 2. Data collection during 2013 TWDB Lake Tyler survey

Data processing

Model boundaries

The reservoir boundary was digitized from aerial photographs, also known as digital orthophoto quarter-quadrangle images (DOQQs), obtained from the Texas Natural Resources Information System (TNRIS, 2013) using Environmental Systems Research Institute's ArcGIS software. The quarter-quadrangles that cover Lake Tyler are Bascom (SE, SW), Troup West (NE, NW), Troup East (NW), and Hope Pond (SW). The DOQQs were photographed on January 7, 2009, while the daily average water surface elevation measured 375.63 feet (NGVD29). According to metadata associated with the 2009 DOQQs, the photographs have a resolution or ground sample distance of 1.0-meters and a horizontal accuracy within ± 6 meters to true ground (TNRIS, 2010, USDA, 2013,). For this analysis, the boundary was digitized at the land-water interface in the 2009 photographs and given an elevation of 375.6 feet.

Triangulated Irregular Network model

Following completion of data collection, the raw data files collected by TWDB were edited to remove data anomalies. DepthPic©, software developed by SDI, Inc., is used to display, interpret, and edit the multi-frequency data by manually removing data anomalies in the current bottom surface and manually digitizing the reservoir-bottom surface at the time of initial impoundment (i.e. pre-impoundment surface). For processing outside of DepthPic©, an in-house software package, HydroTools, is used to identify the current reservoir-bottom surface, pre-impoundment surface, sediment thickness at each sounding location, and output the data into a single file. The water surface elevation at the time of each sounding was used to convert each sounding depth to a corresponding reservoir-bottom elevation. This survey point dataset is then preconditioned by inserting a uniform grid of artificial survey points between the actual survey lines. Bathymetric elevations at these artificial points are determined using an anisotropic spatial interpolation algorithm described in the spatial interpolation of reservoir bathymetry section below. This technique creates a high resolution, uniform grid of interpolated bathymetric elevation points throughout a majority of the reservoir (McEwen et al., 2011a). Finally, the point file resulting from spatial interpolation is used in conjunction with sounding and boundary data to create volumetric and sediment Triangulated Irregular Network (TIN) models utilizing the 3D Analyst Extension of ArcGIS. The 3D Analyst algorithm uses Delaunay's criteria for triangulation to create a grid composed of triangles from non-uniformly spaced points, including the boundary vertices (ESRI, 1995).

Spatial interpolation of reservoir bathymetry

Isotropic spatial interpolation techniques such as the Delaunay triangulation used by the 3D Analyst extension of ArcGIS are, in many instances, unable to suitably interpolate bathymetries between survey lines common to reservoir surveys. Reservoirs and stream channels are anisotropic morphological features where bathymetry at any particular location is more similar to upstream and downstream locations than to transverse locations. Interpolation schemes that do not consider this anisotropy lead to the creation of several types of artifacts in the final representation of the reservoir bottom surface and hence to errors in volume. These include: artificially-curved contour lines extending into the reservoir where the reservoir walls are steep or the reservoir is relatively narrow; intermittent representation of submerged stream channel connectivity; and oscillations of contour lines in between survey lines. These artifacts reduce the accuracy of the resulting volumetric and sediment TIN models in areas between actual survey data.

To improve the accuracy of bathymetric representation between survey lines, TWDB developed various anisotropic spatial interpolation techniques. Generally, the directionality of interpolation at different locations of a reservoir can be determined from external data sources. A basic assumption is that the reservoir profile in the vicinity of a particular location has upstream and downstream similarity. In addition, the sinuosity and directionality of submerged stream channels can be determined from direct examination of survey data or more robustly by examining scanned USGS 7.5 minute quadrangle maps (known as digital raster graphics) and hypsography files (the vector format of USGS 7.5 minute quadrangle map contours), when available. Using the survey data, polygons are created to partition the reservoir into segments with centerlines defining directionality of interpolation within each segment. For surveys with similar spatial coverage, these interpolation definition files are in principle independent of the survey data and could be applied to past and future survey data of the same reservoir. In practice, however, minor revisions of the interpolation definition files may be needed to account for differences in spatial coverage and boundary conditions between surveys. Using the interpolation definition files and survey data, the current reservoir-bottom elevation, pre-impoundment elevation, and sediment thickness are calculated for each point in the high resolution uniform grid of artificial survey points. The reservoir boundary, artificial survey points grid, and survey data points are used to create volumetric and sediment TIN models representing the reservoir bathymetry and sediment accumulation throughout the reservoir.

Specific details of this interpolation technique can be found in the HydroTools manual (McEwen et al., 2011a) and in McEwen et al., 2011b.

In areas inaccessible to survey data collection such as small coves and shallow upstream areas of the reservoir, linear extrapolation is used for volumetric and sediment accumulation estimations. The linear extrapolation follows a linear definition file linking the survey points file to the lake boundary file (McEwen et al., 2011a). Without extrapolated data, the TIN Model builds flat triangles. A flat triangle is defined as a triangle where all three vertices are equal in elevation, generally the elevation of the reservoir boundary. Reducing flat triangles by applying linear extrapolation improves the elevation-capacity and elevation-area calculations. It is not possible to remove all flat triangles, and linear extrapolation is only applied where adding bathymetry is deemed reasonable. For example, linear extrapolation was deemed reasonable and applied to Lake Tyler in the following situations: in small coves of the main body of the lake and in obvious channel features visible in aerial photographs taken on July 28, 2012, while the daily average water surface elevation measured 372.19 feet or where 1997 survey data indicated channel morphology.

Figure 3 illustrates typical results from application of the anisotropic interpolation and linear extrapolation techniques to Lake Tyler. The bathymetry shown in Figure 3C was used in computing reservoir capacity and area tables (Appendix A, B). In Figure 3A, deeper channels, depressions, or ridges indicated by surveyed cross sections are not continuously represented in areas between survey cross sections. This is an artifact of the TIN generation routine rather than an accurate representation of the physical bathymetric surface. Inclusion of interpolation points, represented in Figure 3C, in creation of the volumetric TIN model directs Delaunay triangulation to better represent the lake bathymetry between survey cross-sections.

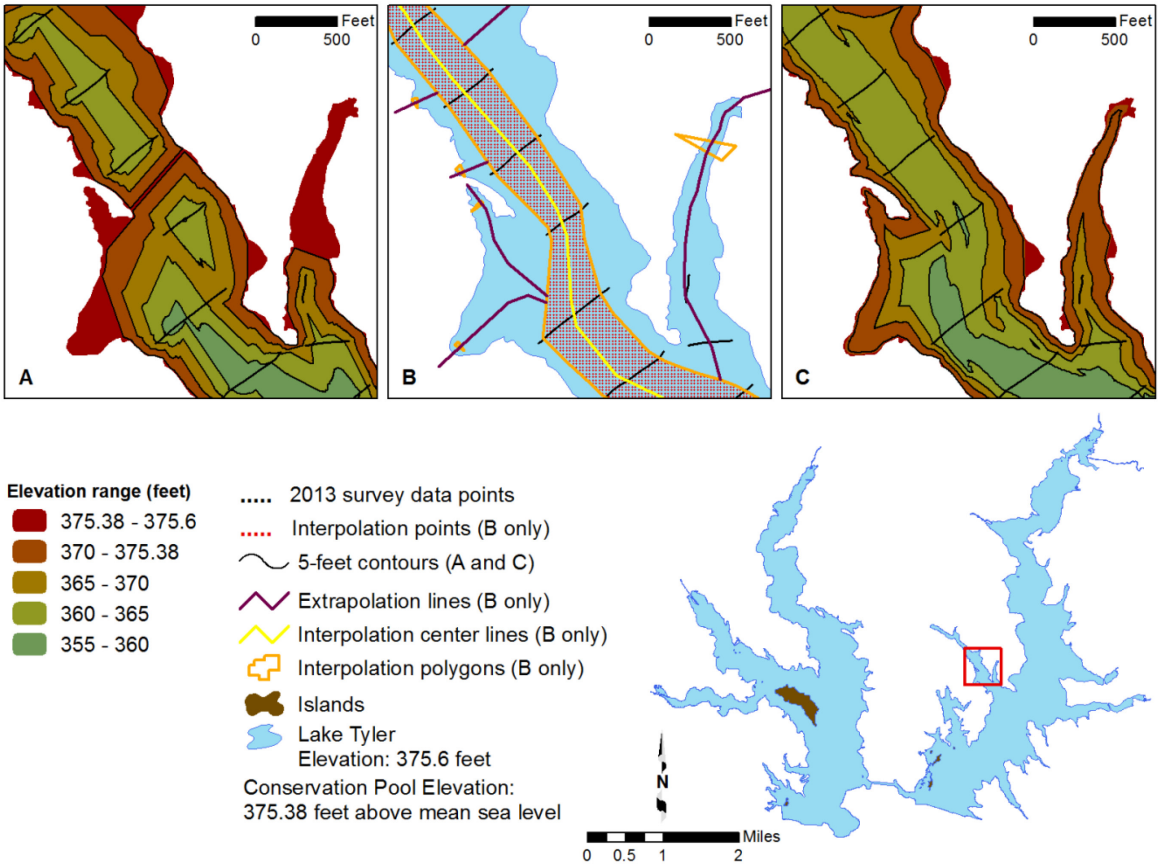


Figure 3. Anisotropic spatial interpolation and linear extrapolation of Lake Tyler sounding data - A) bathymetric contours without interpolated points, B) sounding points (black) and interpolated points (red), C) bathymetric contours with the interpolated points

Area, volume, and contour calculation

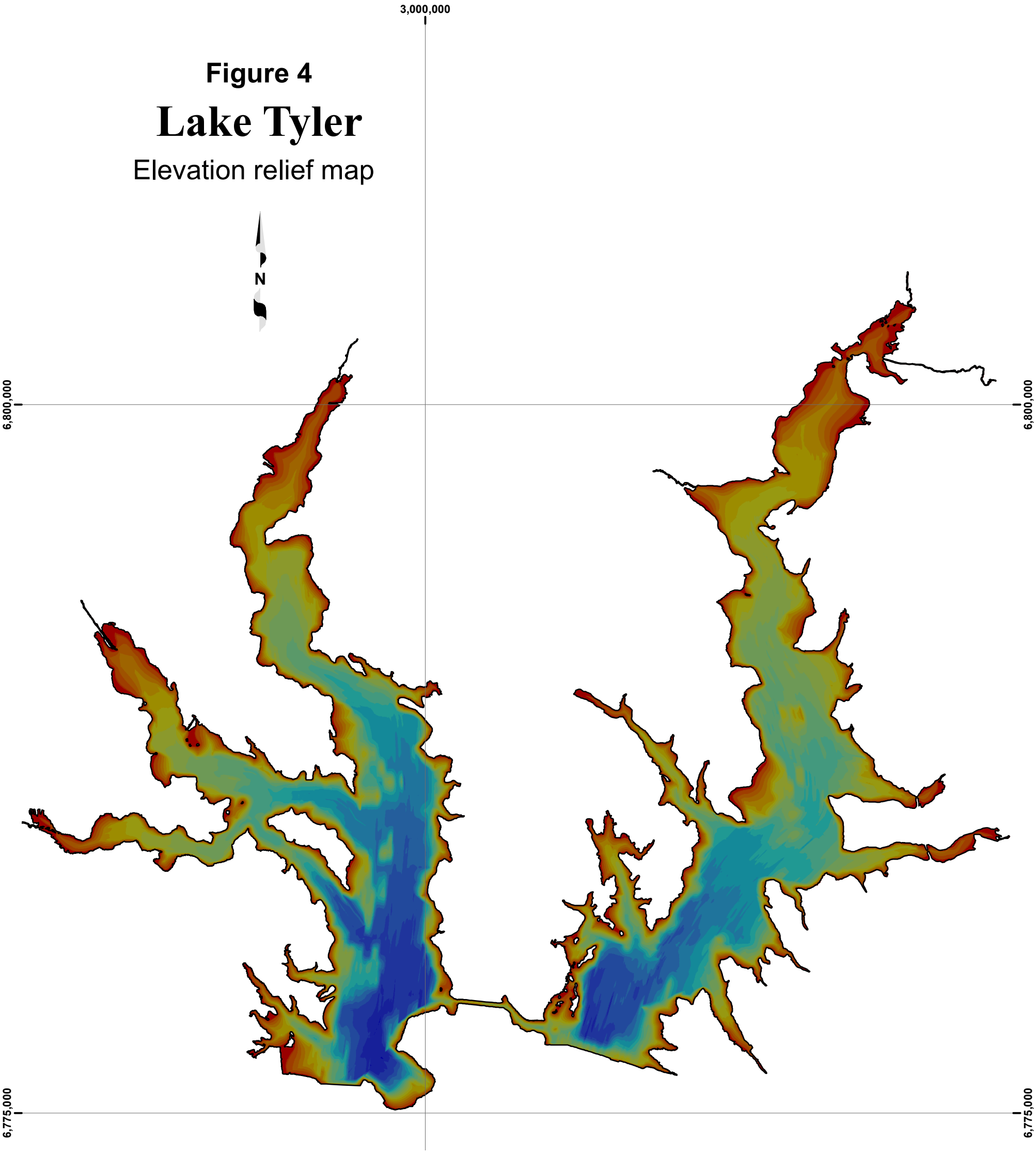
Using ArcInfo software and the volumetric TIN model, volumes and areas were calculated for the entire reservoir at 0.01 feet intervals, from 337.0 to 375.6 feet. The elevation-capacity table and elevation-area table, updated for 2013, are presented in Appendices A and B, respectively. The area-capacity curves are presented in Appendix C.

The volumetric TIN model was converted to a raster representation using a cell size of 2 feet by 2 feet. The raster data was then used to produce an elevation relief map (Figure 4), representing the topography of the reservoir bottom; a depth range map (Figure 5), showing shaded depth ranges for Lake Tyler; and a 5-foot contour map (Figure 6 - attached).

Figure 4

Lake Tyler

Elevation relief map



Elevations
(feet above mean sea level)

375.38 - 375.6	358 - 360	342 - 344
374 - 375.38	356 - 358	340 - 342
372 - 374	354 - 356	338 - 340
370 - 372	352 - 354	337.46 - 338
368 - 370	350 - 352	
366 - 368	348 - 350	
364 - 366	346 - 348	
362 - 364	344 - 346	
360 - 362		

Lake Tyler
elevation: 375.6 feet

Conservation pool elevation:
375.38 feet above mean sea level

Projection: NAD83 State Plane
Texas North Central Zone (feet)

0 0.5 1 2 Miles

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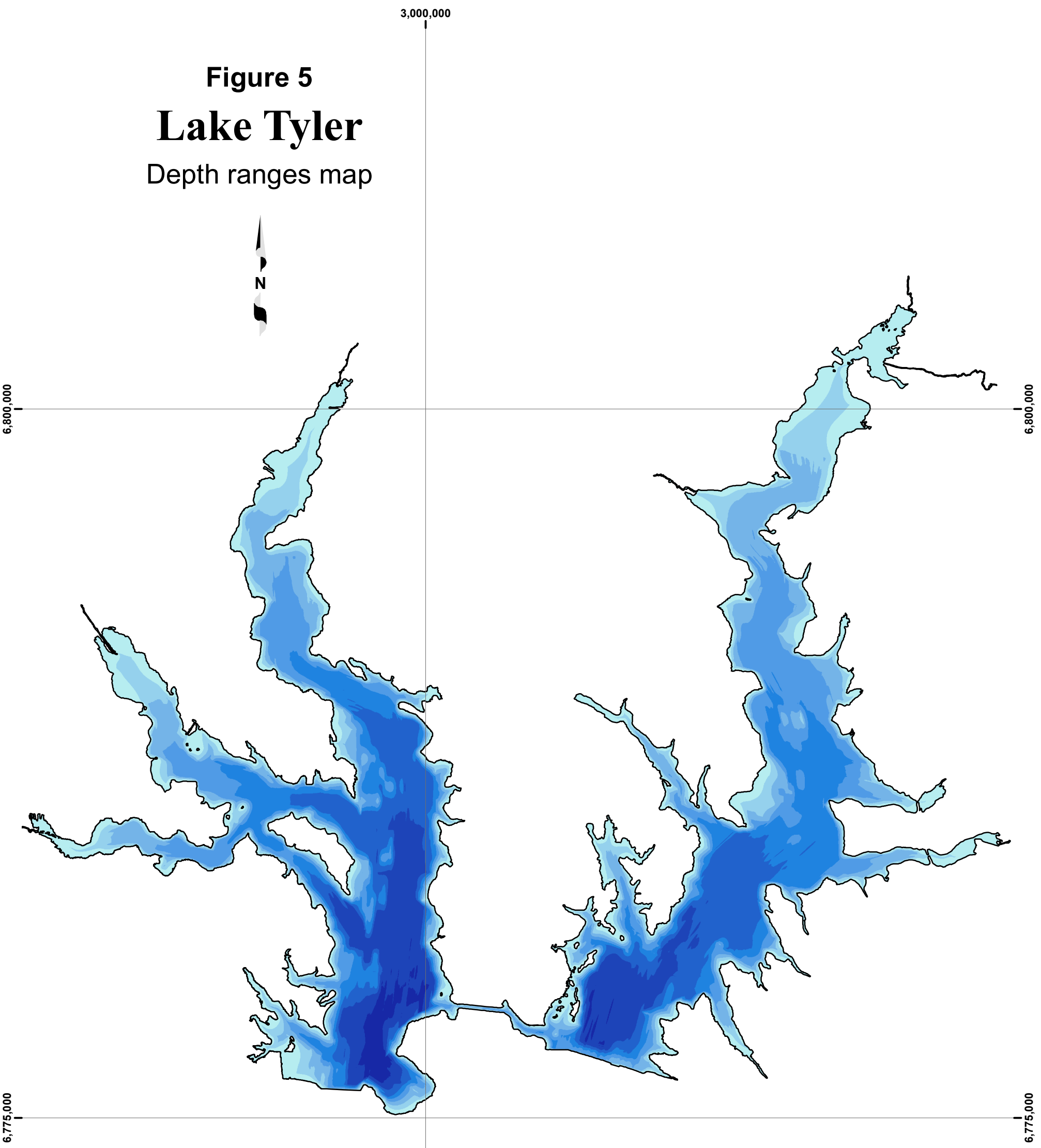
Figure 5

Lake Tyler

Depth ranges map



Depth ranges
(feet)

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- > 35

Lake Tyler
elevation: 375.6 feet

Conservation pool elevation:
375.38 feet above mean sea level

Projection: NAD83 State Plane
Texas North Central Zone (feet)

0 0.5 1 2 Miles

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Analysis of sediment data from Lake Tyler

Sedimentation in Lake Tyler was determined by analyzing the acoustic signal returns of all three depth sounder frequencies in the DepthPic© software. The 200 kHz signal was analyzed to determine the current bathymetric surface of the reservoir, while all three frequencies, 200 kHz, 50 kHz, and 24 kHz, were analyzed to determine the reservoir bathymetric surface at the time of initial impoundment (i.e. pre-impoundment surface). Sediment core samples collected in the reservoir were used to assist in identifying the location of the pre-impoundment surface in the acoustic signals. The difference between the current surface and the pre-impoundment surface yields a sediment thickness value at each sounding location.

Analysis of the sediment core samples was conducted at TWDB headquarters in Austin. Each sample was split longitudinally and analyzed to identify the location of the pre-impoundment surface. The pre-impoundment surface is identified within the sediment core sample by one or a combination of the following methods: (1) a visual examination of the sediment core for terrestrial materials, such as leaf litter, tree bark, twigs, intact roots, etc., concentrations of which tend to occur on or just below the pre-impoundment surface; (2) changes in texture from well sorted, relatively fine-grained sediment to poorly sorted mixtures of coarse and fine-grained materials; and (3) variations in the physical properties of the sediment, particularly sediment water content and penetration resistance with depth (Van Metre et al., 2004). The total sample length, sediment thickness, and the pre-impoundment thickness were recorded. Physical characteristics of the sediment core, including color, texture, relative water content, and presence of organic materials, were also recorded (Table 2).

Table 2. Sediment core sampling analysis data - Lake Tyler

Core	Easting[a] (ft)	Northing[a] (ft)	Total core sample/ post-impoundment sediment	Sediment core description	Munsell soil color
T-1	3006747.98	6779978.56	36”/24.5”	0-15.5” Possible fluff settled, no sediment	N/A
				15.5-20.5” loam soil	5Y 3/2
				20.5-24.5” sandy loam soil, organics present	2.5Y 3/2
				24.5-28” loamy sand soil, fewer organics present	10YR 3/1
				28-36” sand	2.5Y 8/1
T-2	3013551.23	6783731.58	26”/14”	0-14” high water content, silty loam	2.5Y 3/1
				14-16” lower water content, sandy clay soil, organics present	2.5Y 4/2
				16-26” lower water content, sandy clay soil, organics present	10YR 4/2
T-3	3013313.11	6790052.08	30.5”/7”	0-7” high water content, silty loam	2.5Y 3/1
				7-30.5” lower water content, sandy clay soil, organics present	10YR 4/2
T-4	2999686.57	6779161.44	28”/28”	0-17” high water content, silty loam sediment	2.5Y 3/1
				17-28” higher density, sandy clay loam, lots of organics and roots present	10YR 3/2
T-5	2999289.27	6785197.90	27”/13”	0-13” high water content, silty loam	2.5Y 3/1
				13-27” sandy clay, lower water content, organics present	10YR 5/1
T-6	2998652.88	6788720.40	45.5”/18”	0-13.5” high water content, silty loam, organics present	2.5Y 3/1
				13.5-18” high water content, sandy clay loam, organics present	10YR 3/2
				18-45.5” lower water content, sandy clay, some organics	10YR 5/1
T-7	2996505.74	6786257.42	27.5”/13.5”	0-13.5” high water content, silty loam, organics present	2.5Y 3/1
				13.5-27.5” lower water content, sandy loam clay, organics present	7.5YR 4/2

[a] Coordinates are based on NAD83 State Plane Texas North Central System (feet)

A photograph of sediment core T-2 is shown in Figure 7 and is representative of the sediment cores sampled from Lake Tyler. The 200 kHz frequency measures the top layer as the current bottom surface of the reservoir.

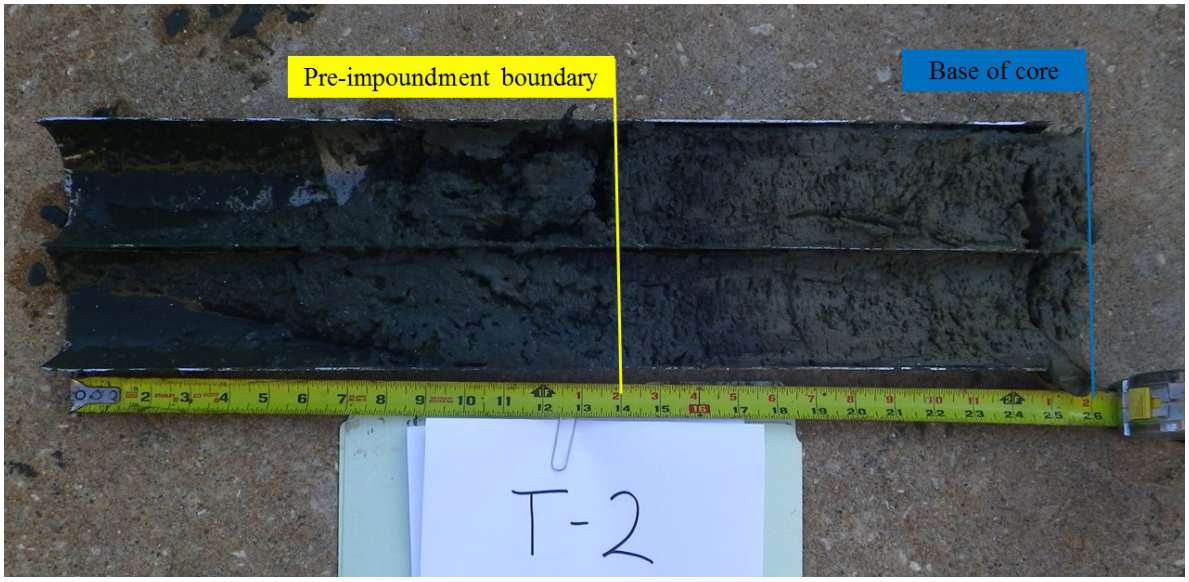


Figure 7. Sediment core T-2 from Lake Tyler

Sediment core sample T-2 consisted of 26 inches of total sediment corresponding to the length of the aluminum sampling tube. The upper sediment layer (horizon), 0-14.0 inches, consisted of high water content, silty loam and measured 2.5Y 3/1 on the Munsell soil color chart. The second horizon, beginning at 14.0 inches and extending to 16.0 inches below the surface, consisted of lower water content, sandy clay soil, organics present and measured 2.5Y 4/2 on the Munsell soil color chart. The third horizon, from 16.0 inches to 26.0 inches, consisted of lower water content, sandy clay soil, organics present and a 10YR 4/2 Munsell soil color. The base of the sample is denoted by the blue line in Figure 7.

The pre-impoundment boundary (yellow line in Figure 7) was evident within this sediment core sample at 14.0 inches and identified by the change in color, texture, moisture, porosity, and structure. Identification of the pre-impoundment surface for the remaining sediment cores followed a similar procedure.

Figures 8 and 9 illustrate how measurements from sediment core samples are used with sonar data to help identify the interface between the post- and pre-impoundment layers in the acoustic signal. Within DepthPic©, the current surface is automatically determined based on signal returns from the 200 kHz transducer and verified by TWDB staff, while the pre-impoundment surface must be determined visually. The pre-impoundment surface is first identified along cross-sections for which sediment core samples have been collected.

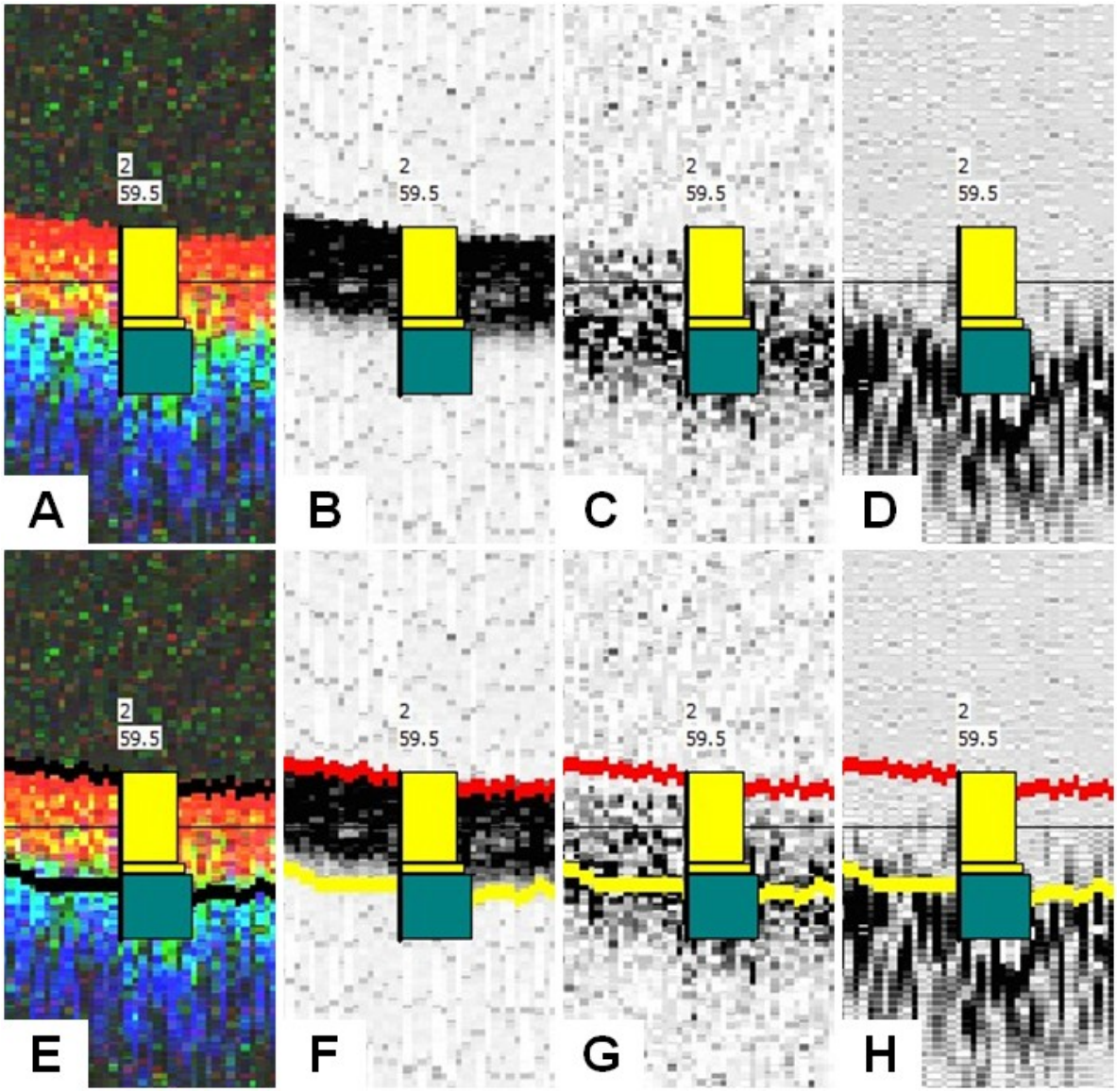


Figure 8. Comparison of sediment core T-2 with acoustic signal returns A,E) combined acoustic signal returns, B,F) 200 kHz frequency, C,G) 50 kHz frequency, D,H) 24 kHz frequency

Figure 8 compares sediment core sample T-2 with the acoustic signals for all frequencies combined (A, E), 200 kHz (B, F), 50 kHz (C, G), and 24 kHz (D, H). The sediment core sample is represented in each figure as colored boxes. The yellow boxes represent post-impoundment sediment, and the blue box represents the pre-impoundment sediment. In Figure 8A-D, the bathymetric surfaces are not shown. In Figure 8E, the current bathymetric surface is represented as the top black line and in Figures 8 F-H as the top red line. The pre-impoundment surface is identified by comparing boundaries observed in the 200 kHz, 50 kHz and 24 kHz signals to the location of the pre-impoundment surface of the sediment core sample. Each sediment core sample was compared to all three frequencies and the boundary in the 200 kHz signal most closely matched the pre-impoundment interface of the sediment core samples; therefore, the 200 kHz signal was used to locate the

pre-impoundment layer. The pre-impoundment surface was manually drawn and is represented by the bottom black line in Figure 8E, and by the yellow line in Figures 8F-H. Figure 9 shows sediment core sample T-2 correlated with the 200 kHz frequency of the nearest surveyed cross-section. The pre-impoundment surface identified along cross-sections where sediment core samples were collected is used as a guide for identifying the pre-impoundment surface along cross-sections where sediment core samples were not collected.

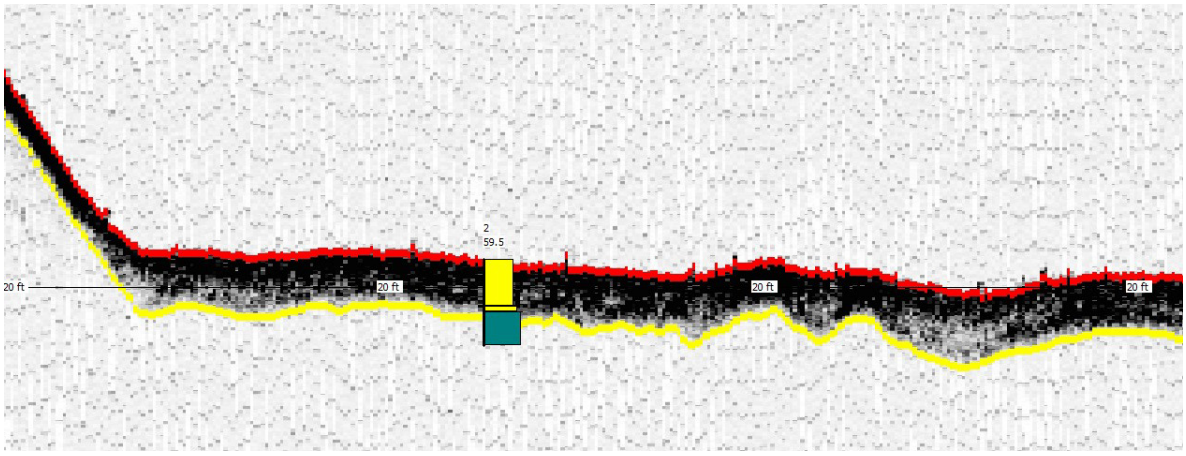


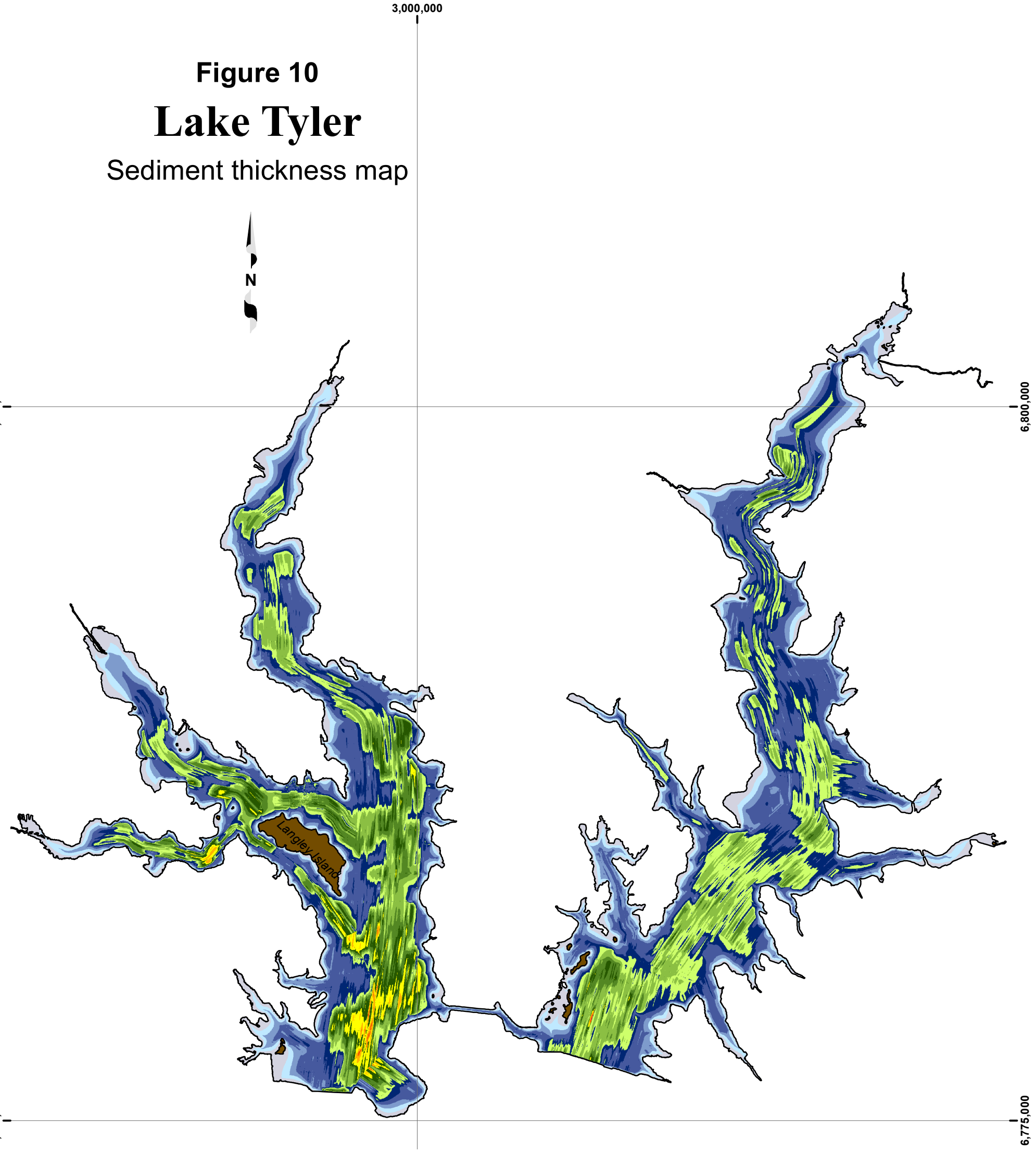
Figure 9. Cross-section of data collected during 2013 survey, displayed in DepthPic© (200 kHz frequency), correlated with sediment core sample T-2 and showing the current surface in red and pre-impoundment surface in yellow

After the pre-impoundment surface from all cross-sections was identified, a sediment thickness TIN model is created following standard GIS techniques (Furnans, 2007). Sediment thicknesses were interpolated between surveyed cross-sections using HydroTools with the same interpolation definition file used for bathymetric interpolation. For the purposes of the TIN model creation, TWDB assumed sediment thickness at the reservoir boundary was zero feet (defined as the 375.6 foot NGVD29 elevation contour). The sediment thickness TIN model was converted to a raster representation using a cell size of 5 feet by 5 feet and used to produce a sediment thickness map of Lake Tyler (Figure 10).

Figure 10

Lake Tyler

Sediment thickness map



Sediment thickness
(feet)

- 0 - 0.25
- 0.26 - 0.5
- 0.51 - 0.75
- 0.76 - 1
- 1.01 - 1.25
- 1.26 - 1.5
- 1.51 - 1.75
- 1.76 - 2
- 2.01 - 2.25
- 2.26 - 2.5
- 2.51 - 2.75
- 2.76 - 3
- 3.01 - 3.25
- 3.26 - 3.5
- 3.51 - 3.75
- 3.76 - 4
- 4.01 - 4.25

Lake Tyler
elevation: 375.6 feet

Islands

Conservation pool elevation:
375.38 feet above mean sea level

Projection: NAD83 State Plane
Texas North Central Zone (feet)

0 0.5 1 2 Miles

Texas Water Development Board

January 2013 Survey

Survey results

Volumetric survey

The results of the 2013 TWDB volumetric survey indicate Lake Tyler has a total reservoir capacity of 77,284 acre-feet and encompasses 4,714 acres at conservation pool elevation (375.38 feet above mean sea level, NGVD29). In 1966-67, the U.S. Geological Survey calculated an estimate capacity of 80,900 acre-feet encompassing 4,880 acres. Because of differences in past and present survey methodologies, direct comparison of volumetric surveys to estimate loss of capacity is difficult and can be unreliable.

To properly compare results of TWDB surveys, TWDB applied the 2013 data processing techniques to the data collected in 1997. Specifically, TWDB applied anisotropic spatial interpolation to the survey data collected in 1997 using the same interpolation definition file as was used for the 2013 survey with minor edits to account for differences in data coverage and boundary conditions. The original boundary used for modeling purposes in 1997 was digitized from USGS 7.5 minute quadrangle maps: Troup West (1973), Troup East (1973), Bascom (Photo-Revised 1972), and Hope Pond (1966). However, this boundary did not align with the survey data and many survey points were outside the boundary. Therefore, a new boundary was digitized for modeling purposes from aerial photographs, or DOQQs, taken on February 1, 1995, while the water surface elevation of the reservoir measured 375.8 feet above mean sea level. The 1996 DOQQs that cover Lake Tyler are Bascom (SW, SE), Troup West (NW, NE), Troup East (NW), and Hope Pond (SW). The boundary was digitized at the land-water interface and defined as 375.8 feet for modeling purposes. According to the associated metadata, the 1995-1996 DOQQs have a resolution of 1-meter, with a horizontal positional accuracy that meets the National Map Accuracy Standards (NMAS) for 1:12,000-scale products. Re-evaluation of the 1997 survey resulted in a 3.9 percent increase in total capacity estimates (Table 3).

Table 3. Current and previous survey capacity and surface area data

Survey	Surface area (acres)	Total capacity (acre-feet)
1966-67[a]	4,880	80,900
TWDB 1997[b]	4,734	80,103
TWDB 1997 (re-calculated)	5,019	83,244
TWDB 2013	4,714	77,284

[a] Source: (TWDB, 1973)
[b] Source: (TWDB, 1997), Note: In 1997, the conservation pool elevation was rounded to 375.4 feet and total reservoir capacity was reported as 80,198 acre-feet encompassing 4,737 acres. To report the area and capacity at 375.38 feet for comparative purposes, the reported areas and capacities between elevations 375.3 and 375.4 feet were linearly interpolated.

Sedimentation survey

Based on two methods for estimating sedimentation rates presented in Table 4, the 2013 TWDB sedimentation survey estimates Lake Tyler loses between 80 and 373 acre-feet per year of capacity due to sedimentation below conservation pool elevation (375.38 feet NGVD29). The sedimentation survey indicates sediment accumulation varies throughout the reservoir. Accumulation within Hill Creek of Lake Tyler West becomes heavier as it approaches Gilley Creek. The heaviest accumulations measured are between 0.2 and 1.0 miles northwest of Whitehouse Dam. Comparison of capacity estimates of Lake Tyler derived using differing methodologies are provided in Table 4 for sedimentation rate calculation. Based on the 2013 estimated sediment volume, Lake Tyler lost an average of approximately 107 acre-feet of capacity per year from 1968 to 2013.

Table 4. Capacity loss comparisons for Lake Tyler

Survey	Volume comparisons at conservation pool elevation (acre-feet)		Pre-impoundment (acre-feet)
1966-67[a]	80,900	<>	<>
TWDB 1997 (re-calculated)	<>	83,244	<>
TWDB pre-impoundment estimate based on 2013 survey	<>	<>	82,097[c]
2013 volumetric survey	77,284	77,284	77,284
Volume difference (acre-feet)	3,616 (4.5%)	5,960 (7.2%)	4,813 (5.9%)
Number of years	45[b]	16	45
Capacity loss rate (acre-feet/year)	80	373	107

[a] Source: (TWDB, 1973), note: The original Lake Tyler was impounded by Whitehouse Dam on January 8, 1949, and the original Lake Tyler East was impounded by Mud Creek Dam on November 22, 1966. The two lakes were joined by a canal on May 29, 1968, and the combined lakes designated as Lake Tyler.
[b] Number of years based on difference between 2013 survey date and 1968 date the two lakes were joined by a canal
[c] 2013 TWDB surveyed capacity of 77,284acre-feet plus 2013 TWDB surveyed sediment volume of 4,813acre-feet

Intake structure

Survey data was collected around the intake structure following planned survey lines oriented parallel to and perpendicular to the intake structure in a 50-foot grid pattern extending approximately 500 feet on all sides of the intake. The structure is located at Latitude 32.24º N and Longitude 95.176º W approximately two miles north of Whitehouse Dam. Figure 11 shows the elevation relief of the area in detail, and Figure 12 shows the sediment thicknesses of the area in detail.

2,994,000

2,996,000

Figure 11

Lake Tyler West Reservoir

Elevation relief map - intake structure

⊕ Intake site

Intake platform

2-feet contours

Lake Tyler West Reservoir elevation: 375.6 feet

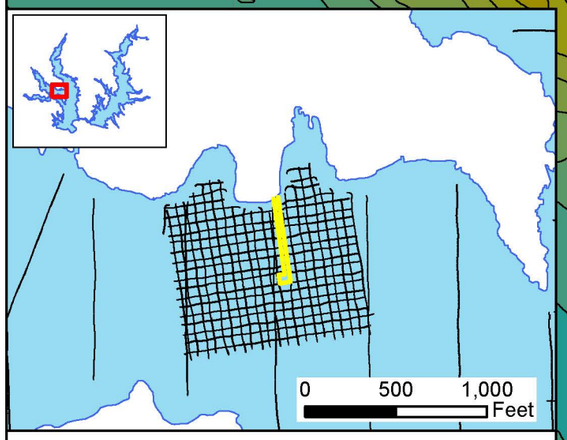
Conservation pool elevation: 375.38 feet above mean sea level

Projection: NAD83 State Plane Texas North Central Zone (feet)

0 125 250 500 Feet

N

374
372
370
368
366
364
362
360
358
356
354
352
350
348



Elevations
(feet above mean sea level)

374.38 - 375.6	360 - 362
374 - 374.38	358 - 360
372 - 374	356 - 358
370 - 372	354 - 356
368 - 370	352 - 354
366 - 368	350 - 352
364 - 366	348 - 350
362 - 364	346 - 348

Langley Island

Texas Water Development Board

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6,786,000

6,786,000

2,994,000

2,996,000

Figure 12

Lake Tyler West Reservior

Sediment thickness map - intake structure

2,994,000

2,996,000

6,786,000

Intake site

Intake platform

Lake Tyler West Reservior
elevation: 375.6 feet

Conservation pool elevation:
375.38 feet above mean sea level

Projection: NAD83 State Plane
Texas North Central Zone (feet)

0 125 250 500
Feet

N

0 500 1,000
Feet

Sediment thickness
(feet)

- 0 - 0.25
- 0.26 - 0.5
- 0.51 - 0.75
- 0.76 - 1
- 1.01 - 1.25
- 1.26 - 1.5
- 1.51 - 1.75
- 1.76 - 2
- 2.01 - 2.25
- 2.26 - 2.5
- 2.51 - 2.75

Langley Island

Texas Water Development Board

January 2013 Survey

Recommendations

To improve estimates of sediment accumulation rates, TWDB recommends resurveying Lake Tyler in approximately 10 years or after a major flood event. To further improve estimates of sediment accumulation, TWDB recommends another sedimentation survey. A re-survey would allow a more accurate quantification of the average sediment accumulation rate for Lake Tyler.

TWDB contact information

More information about the Hydrographic Survey Program can be found at:

http://www.twdb.texas.gov/surfacewater/surveys/index.asp

Any questions regarding the TWDB Hydrographic Survey Program may be addressed to:

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Or

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Appendix A

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
337	0	0	0	0	0	0	0	0	0	0
337.1	0	0	0	0	0	0	0	0	0	0
337.2	0	0	0	0	0	0	0	0	0	0
337.3	0	0	0	0	0	0	0	0	0	0
337.4	0	0	0	0	0	0	0	0	0	0
337.5	0	0	0	0	0	0	0	0	0	0
337.6	0	0	0	0	0	0	0	0	0	0
337.7	0	0	0	0	0	0	0	0	0	0
337.8	0	0	0	0	0	0	0	0	0	0
337.9	0	0	0	0	0	0	0	0	0	0
338	0	0	0	0	0	0	0	0	0	0
338.1	0	0	0	0	0	0	0	0	0	0
338.2	0	0	0	0	0	0	0	0	0	0
338.3	0	0	0	0	0	0	0	0	0	0
338.4	0	0	0	1	1	1	1	1	1	1
338.5	1	1	1	1	1	1	1	1	1	1
338.6	1	1	1	1	1	1	1	1	1	1
338.7	1	1	1	2	2	2	2	2	2	2
338.8	2	2	2	2	2	2	2	2	2	2
338.9	3	3	3	3	3	3	3	3	3	3
339	3	3	4	4	4	4	4	4	4	4
339.1	4	5	5	5	5	5	5	5	5	6
339.2	6	6	6	6	6	6	7	7	7	7
339.3	7	7	8	8	8	8	8	8	9	9
339.4	9	9	9	10	10	10	10	11	11	11
339.5	11	12	12	12	12	13	13	13	13	14
339.6	14	14	14	15	15	15	16	16	16	16
339.7	17	17	17	18	18	18	19	19	19	20
339.8	20	20	21	21	21	22	22	22	23	23
339.9	23	24	24	25	25	25	26	26	27	27
340	27	28	28	29	29	30	30	30	31	31
340.1	32	32	33	33	34	34	35	35	36	36
340.2	37	37	38	38	39	39	40	40	41	42
340.3	42	43	43	44	44	45	46	46	47	47
340.4	48	49	49	50	50	51	52	52	53	54
340.5	54	55	56	56	57	58	59	59	60	61
340.6	62	62	63	64	65	66	66	67	68	69
340.7	70	71	71	72	73	74	75	76	77	78
340.8	79	80	81	82	83	84	85	86	87	88
340.9	89	90	91	92	93	94	95	96	97	98
341	99	101	102	103	104	105	106	108	109	110
341.1	111	112	114	115	116	117	119	120	121	123
341.2	124	125	126	128	129	131	132	133	135	136
341.3	137	139	140	142	143	145	146	147	149	150
341.4	152	153	155	156	158	159	161	163	164	166
341.5	167	169	170	172	174	175	177	178	180	182
341.6	183	185	187	188	190	192	193	195	197	199
341.7	200	202	204	206	207	209	211	213	215	216
341.8	218	220	222	224	226	228	229	231	233	235
341.9	237	239	241	243	245	247	249	251	253	255
342	257	259	261	263	265	267	270	272	274	276
342.1	278	280	282	285	287	289	291	293	296	298
342.2	300	302	305	307	309	312	314	316	319	321
342.3	324	326	328	331	333	336	338	341	343	346
342.4	348	351	353	356	358	361	364	366	369	371
342.5	374	377	379	382	385	387	390	393	395	398
342.6	401	404	406	409	412	415	418	420	423	426
342.7	429	432	435	438	440	443	446	449	452	455
342.8	458	461	464	467	470	473	476	479	482	485
342.9	488	491	495	498	501	504	507	510	513	517

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
343	520	523	526	530	533	536	539	543	546	549
343.1	552	556	559	562	566	569	572	576	579	583
343.2	586	589	593	596	600	603	607	610	614	617
343.3	621	624	628	631	635	638	642	645	649	653
343.4	656	660	663	667	671	674	678	682	685	689
343.5	693	696	700	704	707	711	715	718	722	726
343.6	730	734	737	741	745	749	753	756	760	764
343.7	768	772	776	780	783	787	791	795	799	803
343.8	807	811	815	819	823	827	831	835	839	843
343.9	847	851	855	859	863	868	872	876	880	884
344	888	892	896	901	905	909	913	917	922	926
344.1	930	934	939	943	947	952	956	960	965	969
344.2	973	978	982	986	991	995	999	1,004	1,008	1,013
344.3	1,017	1,022	1,026	1,031	1,035	1,040	1,044	1,049	1,053	1,058
344.4	1,062	1,067	1,071	1,076	1,080	1,085	1,089	1,094	1,099	1,103
344.5	1,108	1,112	1,117	1,122	1,126	1,131	1,136	1,140	1,145	1,150
344.6	1,154	1,159	1,164	1,168	1,173	1,178	1,182	1,187	1,192	1,197
344.7	1,201	1,206	1,211	1,216	1,221	1,225	1,230	1,235	1,240	1,245
344.8	1,249	1,254	1,259	1,264	1,269	1,274	1,279	1,284	1,288	1,293
344.9	1,298	1,303	1,308	1,313	1,318	1,323	1,328	1,333	1,338	1,343
345	1,348	1,353	1,358	1,363	1,368	1,373	1,378	1,383	1,388	1,393
345.1	1,399	1,404	1,409	1,414	1,419	1,424	1,429	1,434	1,440	1,445
345.2	1,450	1,455	1,460	1,465	1,471	1,476	1,481	1,486	1,491	1,497
345.3	1,502	1,507	1,512	1,518	1,523	1,528	1,533	1,539	1,544	1,549
345.4	1,555	1,560	1,565	1,571	1,576	1,581	1,587	1,592	1,598	1,603
345.5	1,608	1,614	1,619	1,625	1,630	1,635	1,641	1,646	1,652	1,657
345.6	1,663	1,668	1,674	1,679	1,685	1,690	1,696	1,701	1,707	1,713
345.7	1,718	1,724	1,729	1,735	1,740	1,746	1,752	1,757	1,763	1,769
345.8	1,774	1,780	1,786	1,791	1,797	1,803	1,808	1,814	1,820	1,826
345.9	1,831	1,837	1,843	1,849	1,854	1,860	1,866	1,872	1,878	1,884
346	1,889	1,895	1,901	1,907	1,913	1,919	1,925	1,931	1,937	1,943
346.1	1,949	1,955	1,961	1,967	1,973	1,979	1,985	1,991	1,997	2,003
346.2	2,009	2,015	2,021	2,027	2,034	2,040	2,046	2,052	2,058	2,064
346.3	2,071	2,077	2,083	2,089	2,096	2,102	2,108	2,114	2,121	2,127
346.4	2,133	2,140	2,146	2,152	2,159	2,165	2,171	2,178	2,184	2,190
346.5	2,197	2,203	2,210	2,216	2,223	2,229	2,236	2,242	2,249	2,255
346.6	2,262	2,268	2,275	2,281	2,288	2,294	2,301	2,308	2,314	2,321
346.7	2,327	2,334	2,341	2,347	2,354	2,361	2,367	2,374	2,381	2,387
346.8	2,394	2,401	2,408	2,414	2,421	2,428	2,435	2,442	2,448	2,455
346.9	2,462	2,469	2,476	2,483	2,490	2,497	2,503	2,510	2,517	2,524
347	2,531	2,538	2,545	2,552	2,559	2,566	2,573	2,581	2,588	2,595
347.1	2,602	2,609	2,616	2,623	2,630	2,637	2,645	2,652	2,659	2,666
347.2	2,673	2,681	2,688	2,695	2,702	2,710	2,717	2,724	2,731	2,739
347.3	2,746	2,753	2,761	2,768	2,776	2,783	2,790	2,798	2,805	2,813
347.4	2,820	2,827	2,835	2,842	2,850	2,857	2,865	2,872	2,880	2,887
347.5	2,895	2,902	2,910	2,917	2,925	2,933	2,940	2,948	2,955	2,963
347.6	2,971	2,978	2,986	2,994	3,001	3,009	3,017	3,024	3,032	3,040
347.7	3,048	3,055	3,063	3,071	3,079	3,087	3,094	3,102	3,110	3,118
347.8	3,126	3,134	3,142	3,150	3,158	3,166	3,174	3,181	3,189	3,198
347.9	3,206	3,214	3,222	3,230	3,238	3,246	3,254	3,262	3,270	3,278
348	3,287	3,295	3,303	3,311	3,319	3,328	3,336	3,344	3,352	3,361
348.1	3,369	3,377	3,386	3,394	3,402	3,411	3,419	3,428	3,436	3,444
348.2	3,453	3,461	3,470	3,478	3,487	3,495	3,504	3,512	3,521	3,530
348.3	3,538	3,547	3,555	3,564	3,573	3,581	3,590	3,599	3,608	3,616
348.4	3,625	3,634	3,643	3,651	3,660	3,669	3,678	3,687	3,696	3,704
348.5	3,713	3,722	3,731	3,740	3,749	3,758	3,767	3,776	3,785	3,794
348.6	3,803	3,812	3,821	3,830	3,839	3,849	3,858	3,867	3,876	3,885
348.7	3,894	3,904	3,913	3,922	3,931	3,941	3,950	3,959	3,968	3,978
348.8	3,987	3,996	4,006	4,015	4,025	4,034	4,043	4,053	4,062	4,072
348.9	4,081	4,091	4,100	4,110	4,120	4,129	4,139	4,148	4,158	4,168

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
349	4,177	4,187	4,197	4,206	4,216	4,226	4,236	4,245	4,255	4,265
349.1	4,275	4,285	4,294	4,304	4,314	4,324	4,334	4,344	4,354	4,364
349.2	4,374	4,384	4,394	4,404	4,414	4,424	4,434	4,444	4,454	4,464
349.3	4,474	4,484	4,494	4,504	4,515	4,525	4,535	4,545	4,555	4,566
349.4	4,576	4,586	4,596	4,607	4,617	4,627	4,637	4,648	4,658	4,668
349.5	4,679	4,689	4,699	4,710	4,720	4,731	4,741	4,751	4,762	4,772
349.6	4,783	4,793	4,804	4,814	4,825	4,835	4,846	4,856	4,867	4,877
349.7	4,888	4,899	4,909	4,920	4,930	4,941	4,952	4,962	4,973	4,984
349.8	4,994	5,005	5,016	5,027	5,037	5,048	5,059	5,070	5,080	5,091
349.9	5,102	5,113	5,124	5,134	5,145	5,156	5,167	5,178	5,189	5,200
350	5,211	5,222	5,232	5,243	5,254	5,265	5,276	5,287	5,298	5,309
350.1	5,320	5,331	5,342	5,353	5,364	5,375	5,387	5,398	5,409	5,420
350.2	5,431	5,442	5,453	5,464	5,475	5,487	5,498	5,509	5,520	5,531
350.3	5,542	5,554	5,565	5,576	5,587	5,599	5,610	5,621	5,632	5,644
350.4	5,655	5,666	5,677	5,689	5,700	5,711	5,723	5,734	5,745	5,757
350.5	5,768	5,780	5,791	5,802	5,814	5,825	5,837	5,848	5,860	5,871
350.6	5,882	5,894	5,905	5,917	5,928	5,940	5,952	5,963	5,975	5,986
350.7	5,998	6,009	6,021	6,033	6,044	6,056	6,067	6,079	6,091	6,102
350.8	6,114	6,126	6,137	6,149	6,161	6,172	6,184	6,196	6,208	6,219
350.9	6,231	6,243	6,255	6,267	6,278	6,290	6,302	6,314	6,326	6,338
351	6,349	6,361	6,373	6,385	6,397	6,409	6,421	6,433	6,445	6,457
351.1	6,469	6,481	6,493	6,505	6,517	6,529	6,541	6,553	6,565	6,577
351.2	6,589	6,601	6,613	6,626	6,638	6,650	6,662	6,674	6,687	6,699
351.3	6,711	6,723	6,735	6,748	6,760	6,772	6,785	6,797	6,809	6,822
351.4	6,834	6,846	6,859	6,871	6,884	6,896	6,909	6,921	6,934	6,946
351.5	6,959	6,971	6,984	6,996	7,009	7,021	7,034	7,047	7,059	7,072
351.6	7,085	7,097	7,110	7,123	7,136	7,148	7,161	7,174	7,187	7,199
351.7	7,212	7,225	7,238	7,251	7,264	7,276	7,289	7,302	7,315	7,328
351.8	7,341	7,354	7,367	7,380	7,393	7,406	7,419	7,432	7,445	7,458
351.9	7,471	7,484	7,498	7,511	7,524	7,537	7,550	7,563	7,576	7,590
352	7,603	7,616	7,629	7,643	7,656	7,669	7,682	7,696	7,709	7,722
352.1	7,736	7,749	7,763	7,776	7,789	7,803	7,816	7,830	7,843	7,857
352.2	7,870	7,884	7,897	7,911	7,924	7,938	7,951	7,965	7,978	7,992
352.3	8,006	8,019	8,033	8,046	8,060	8,074	8,087	8,101	8,115	8,129
352.4	8,142	8,156	8,170	8,184	8,197	8,211	8,225	8,239	8,253	8,267
352.5	8,280	8,294	8,308	8,322	8,336	8,350	8,364	8,378	8,392	8,406
352.6	8,420	8,434	8,448	8,462	8,476	8,490	8,504	8,518	8,532	8,546
352.7	8,561	8,575	8,589	8,603	8,617	8,632	8,646	8,660	8,674	8,689
352.8	8,703	8,717	8,732	8,746	8,760	8,775	8,789	8,803	8,818	8,832
352.9	8,847	8,861	8,876	8,890	8,905	8,919	8,934	8,948	8,963	8,977
353	8,992	9,007	9,021	9,036	9,050	9,065	9,080	9,094	9,109	9,124
353.1	9,139	9,153	9,168	9,183	9,198	9,212	9,227	9,242	9,257	9,272
353.2	9,286	9,301	9,316	9,331	9,346	9,361	9,376	9,391	9,406	9,420
353.3	9,435	9,450	9,465	9,480	9,495	9,511	9,526	9,541	9,556	9,571
353.4	9,586	9,601	9,616	9,631	9,646	9,662	9,677	9,692	9,707	9,722
353.5	9,738	9,753	9,768	9,784	9,799	9,814	9,830	9,845	9,860	9,876
353.6	9,891	9,906	9,922	9,937	9,953	9,968	9,984	9,999	10,015	10,030
353.7	10,046	10,061	10,077	10,092	10,108	10,124	10,139	10,155	10,171	10,186
353.8	10,202	10,218	10,233	10,249	10,265	10,281	10,296	10,312	10,328	10,344
353.9	10,360	10,376	10,392	10,407	10,423	10,439	10,455	10,471	10,487	10,503
354	10,519	10,535	10,551	10,567	10,583	10,599	10,616	10,632	10,648	10,664
354.1	10,680	10,696	10,712	10,729	10,745	10,761	10,777	10,794	10,810	10,826
354.2	10,843	10,859	10,875	10,892	10,908	10,924	10,941	10,957	10,974	10,990
354.3	11,007	11,023	11,040	11,056	11,073	11,089	11,106	11,122	11,139	11,155
354.4	11,172	11,189	11,205	11,222	11,239	11,255	11,272	11,289	11,305	11,322
354.5	11,339	11,356	11,372	11,389	11,406	11,423	11,440	11,457	11,473	11,490
354.6	11,507	11,524	11,541	11,558	11,575	11,592	11,609	11,626	11,643	11,660
354.7	11,677	11,694	11,711	11,728	11,745	11,762	11,779	11,796	11,814	11,831
354.8	11,848	11,865	11,882	11,899	11,917	11,934	11,951	11,968	11,986	12,003
354.9	12,020	12,037	12,055	12,072	12,090	12,107	12,124	12,142	12,159	12,176

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
355	12,194	12,211	12,229	12,246	12,264	12,281	12,299	12,316	12,334	12,351
355.1	12,369	12,386	12,404	12,422	12,439	12,457	12,474	12,492	12,510	12,527
355.2	12,545	12,563	12,580	12,598	12,616	12,634	12,651	12,669	12,687	12,705
355.3	12,722	12,740	12,758	12,776	12,794	12,812	12,829	12,847	12,865	12,883
355.4	12,901	12,919	12,937	12,955	12,973	12,991	13,009	13,027	13,045	13,063
355.5	13,081	13,099	13,117	13,135	13,153	13,171	13,189	13,208	13,226	13,244
355.6	13,262	13,280	13,298	13,317	13,335	13,353	13,371	13,390	13,408	13,426
355.7	13,445	13,463	13,481	13,500	13,518	13,536	13,555	13,573	13,592	13,610
355.8	13,629	13,647	13,666	13,684	13,703	13,721	13,740	13,758	13,777	13,795
355.9	13,814	13,833	13,851	13,870	13,889	13,907	13,926	13,945	13,963	13,982
356	14,001	14,020	14,038	14,057	14,076	14,095	14,114	14,132	14,151	14,170
356.1	14,189	14,208	14,227	14,246	14,265	14,284	14,303	14,322	14,341	14,360
356.2	14,379	14,398	14,417	14,436	14,455	14,475	14,494	14,513	14,532	14,551
356.3	14,570	14,590	14,609	14,628	14,648	14,667	14,686	14,706	14,725	14,744
356.4	14,764	14,783	14,803	14,822	14,841	14,861	14,880	14,900	14,919	14,939
356.5	14,959	14,978	14,998	15,017	15,037	15,057	15,076	15,096	15,116	15,135
356.6	15,155	15,175	15,195	15,214	15,234	15,254	15,274	15,294	15,314	15,334
356.7	15,354	15,373	15,393	15,413	15,433	15,453	15,473	15,493	15,513	15,533
356.8	15,553	15,574	15,594	15,614	15,634	15,654	15,674	15,695	15,715	15,735
356.9	15,755	15,776	15,796	15,816	15,837	15,857	15,877	15,898	15,918	15,939
357	15,959	15,980	16,000	16,021	16,041	16,062	16,082	16,103	16,123	16,144
357.1	16,165	16,185	16,206	16,227	16,247	16,268	16,289	16,309	16,330	16,351
357.2	16,372	16,392	16,413	16,434	16,455	16,476	16,497	16,518	16,538	16,559
357.3	16,580	16,601	16,622	16,643	16,664	16,685	16,706	16,728	16,749	16,770
357.4	16,791	16,812	16,833	16,854	16,876	16,897	16,918	16,939	16,960	16,982
357.5	17,003	17,024	17,046	17,067	17,088	17,110	17,131	17,153	17,174	17,195
357.6	17,217	17,238	17,260	17,281	17,303	17,325	17,346	17,368	17,389	17,411
357.7	17,433	17,454	17,476	17,498	17,519	17,541	17,563	17,585	17,606	17,628
357.8	17,650	17,672	17,694	17,716	17,737	17,759	17,781	17,803	17,825	17,847
357.9	17,869	17,891	17,913	17,935	17,957	17,979	18,001	18,023	18,046	18,068
358	18,090	18,112	18,134	18,156	18,178	18,201	18,223	18,245	18,267	18,290
358.1	18,312	18,334	18,356	18,379	18,401	18,423	18,446	18,468	18,491	18,513
358.2	18,536	18,558	18,580	18,603	18,625	18,648	18,670	18,693	18,716	18,738
358.3	18,761	18,783	18,806	18,829	18,851	18,874	18,896	18,919	18,942	18,965
358.4	18,987	19,010	19,033	19,056	19,078	19,101	19,124	19,147	19,170	19,192
358.5	19,215	19,238	19,261	19,284	19,307	19,330	19,353	19,376	19,399	19,422
358.6	19,445	19,468	19,491	19,514	19,537	19,560	19,583	19,606	19,630	19,653
358.7	19,676	19,699	19,722	19,746	19,769	19,792	19,815	19,838	19,862	19,885
358.8	19,908	19,932	19,955	19,978	20,002	20,025	20,049	20,072	20,096	20,119
358.9	20,142	20,166	20,189	20,213	20,237	20,260	20,284	20,307	20,331	20,354
359	20,378	20,402	20,425	20,449	20,473	20,496	20,520	20,544	20,568	20,591
359.1	20,615	20,639	20,663	20,687	20,710	20,734	20,758	20,782	20,806	20,830
359.2	20,854	20,878	20,901	20,925	20,949	20,973	20,997	21,021	21,045	21,069
359.3	21,093	21,118	21,142	21,166	21,190	21,214	21,238	21,262	21,286	21,310
359.4	21,335	21,359	21,383	21,407	21,431	21,456	21,480	21,504	21,528	21,553
359.5	21,577	21,601	21,626	21,650	21,674	21,699	21,723	21,747	21,772	21,796
359.6	21,821	21,845	21,870	21,894	21,919	21,943	21,967	21,992	22,016	22,041
359.7	22,066	22,090	22,115	22,139	22,164	22,189	22,213	22,238	22,263	22,287
359.8	22,312	22,337	22,361	22,386	22,411	22,436	22,460	22,485	22,510	22,535
359.9	22,560	22,585	22,610	22,634	22,659	22,684	22,709	22,734	22,759	22,784
360	22,809	22,834	22,859	22,884	22,910	22,935	22,960	22,985	23,010	23,035
360.1	23,060	23,085	23,111	23,136	23,161	23,186	23,211	23,237	23,262	23,287
360.2	23,313	23,338	23,363	23,389	23,414	23,439	23,465	23,490	23,515	23,541
360.3	23,566	23,592	23,617	23,643	23,668	23,694	23,719	23,745	23,770	23,796
360.4	23,821	23,847	23,872	23,898	23,924	23,949	23,975	24,001	24,026	24,052
360.5	24,078	24,103	24,129	24,155	24,181	24,206	24,232	24,258	24,284	24,310
360.6	24,335	24,361	24,387	24,413	24,439	24,465	24,491	24,517	24,543	24,569
360.7	24,595	24,621	24,647	24,673	24,699	24,725	24,751	24,777	24,803	24,829
360.8	24,855	24,882	24,908	24,934	24,960	24,986	25,012	25,039	25,065	25,091
360.9	25,118	25,144	25,170	25,196	25,223	25,249	25,275	25,302	25,328	25,355

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
361	25,381	25,408	25,434	25,460	25,487	25,513	25,540	25,566	25,593	25,619
361.1	25,646	25,672	25,699	25,726	25,752	25,779	25,805	25,832	25,859	25,885
361.2	25,912	25,939	25,966	25,992	26,019	26,046	26,073	26,099	26,126	26,153
361.3	26,180	26,207	26,233	26,260	26,287	26,314	26,341	26,368	26,395	26,422
361.4	26,449	26,476	26,503	26,530	26,557	26,584	26,611	26,638	26,665	26,692
361.5	26,719	26,746	26,773	26,801	26,828	26,855	26,882	26,909	26,937	26,964
361.6	26,991	27,018	27,046	27,073	27,100	27,128	27,155	27,182	27,210	27,237
361.7	27,265	27,292	27,319	27,347	27,374	27,402	27,429	27,457	27,484	27,512
361.8	27,539	27,567	27,594	27,622	27,650	27,677	27,705	27,732	27,760	27,788
361.9	27,815	27,843	27,871	27,899	27,926	27,954	27,982	28,010	28,037	28,065
362	28,093	28,121	28,149	28,177	28,204	28,232	28,260	28,288	28,316	28,344
362.1	28,372	28,400	28,428	28,456	28,484	28,512	28,540	28,568	28,596	28,624
362.2	28,652	28,680	28,708	28,736	28,764	28,793	28,821	28,849	28,877	28,905
362.3	28,934	28,962	28,990	29,018	29,047	29,075	29,103	29,131	29,160	29,188
362.4	29,216	29,245	29,273	29,301	29,330	29,358	29,387	29,415	29,444	29,472
362.5	29,501	29,529	29,558	29,586	29,615	29,643	29,672	29,700	29,729	29,757
362.6	29,786	29,815	29,843	29,872	29,901	29,929	29,958	29,987	30,015	30,044
362.7	30,073	30,102	30,130	30,159	30,188	30,217	30,246	30,274	30,303	30,332
362.8	30,361	30,390	30,419	30,448	30,477	30,506	30,534	30,563	30,592	30,621
362.9	30,650	30,679	30,708	30,737	30,767	30,796	30,825	30,854	30,883	30,912
363	30,941	30,970	30,999	31,029	31,058	31,087	31,116	31,145	31,175	31,204
363.1	31,233	31,262	31,292	31,321	31,351	31,380	31,409	31,439	31,468	31,497
363.2	31,527	31,556	31,586	31,615	31,645	31,674	31,704	31,733	31,763	31,792
363.3	31,822	31,851	31,881	31,910	31,940	31,970	31,999	32,029	32,059	32,088
363.4	32,118	32,148	32,178	32,207	32,237	32,267	32,296	32,326	32,356	32,386
363.5	32,416	32,446	32,475	32,505	32,535	32,565	32,595	32,625	32,655	32,685
363.6	32,715	32,745	32,775	32,805	32,835	32,865	32,895	32,925	32,955	32,985
363.7	33,015	33,045	33,075	33,106	33,136	33,166	33,196	33,226	33,256	33,287
363.8	33,317	33,347	33,377	33,407	33,438	33,468	33,498	33,528	33,559	33,589
363.9	33,619	33,650	33,680	33,710	33,741	33,771	33,802	33,832	33,863	33,893
364	33,923	33,954	33,984	34,015	34,045	34,076	34,106	34,137	34,167	34,198
364.1	34,229	34,259	34,290	34,320	34,351	34,382	34,412	34,443	34,473	34,504
364.2	34,535	34,566	34,596	34,627	34,658	34,689	34,719	34,750	34,781	34,812
364.3	34,842	34,873	34,904	34,935	34,966	34,997	35,028	35,059	35,090	35,121
364.4	35,151	35,182	35,213	35,244	35,275	35,306	35,337	35,368	35,400	35,431
364.5	35,462	35,493	35,524	35,555	35,586	35,617	35,648	35,680	35,711	35,742
364.6	35,773	35,805	35,836	35,867	35,898	35,930	35,961	35,992	36,024	36,055
364.7	36,087	36,118	36,150	36,181	36,212	36,244	36,276	36,307	36,339	36,370
364.8	36,402	36,433	36,465	36,497	36,528	36,560	36,592	36,623	36,655	36,687
364.9	36,718	36,750	36,782	36,814	36,846	36,877	36,909	36,941	36,973	37,005
365	37,037	37,069	37,101	37,133	37,165	37,196	37,228	37,260	37,292	37,324
365.1	37,357	37,389	37,421	37,453	37,485	37,517	37,549	37,581	37,613	37,645
365.2	37,678	37,710	37,742	37,774	37,806	37,839	37,871	37,903	37,935	37,968
365.3	38,000	38,032	38,065	38,097	38,129	38,162	38,194	38,227	38,259	38,291
365.4	38,324	38,356	38,389	38,421	38,454	38,486	38,519	38,552	38,584	38,617
365.5	38,649	38,682	38,715	38,747	38,780	38,813	38,845	38,878	38,911	38,944
365.6	38,976	39,009	39,042	39,075	39,108	39,140	39,173	39,206	39,239	39,272
365.7	39,305	39,338	39,371	39,404	39,437	39,470	39,503	39,535	39,569	39,602
365.8	39,635	39,668	39,701	39,734	39,767	39,800	39,833	39,866	39,899	39,933
365.9	39,966	39,999	40,032	40,065	40,099	40,132	40,165	40,198	40,232	40,265
366	40,298	40,332	40,365	40,398	40,432	40,465	40,498	40,532	40,565	40,599
366.1	40,632	40,666	40,699	40,733	40,766	40,800	40,833	40,867	40,900	40,934
366.2	40,968	41,001	41,035	41,069	41,102	41,136	41,170	41,203	41,237	41,271
366.3	41,305	41,338	41,372	41,406	41,440	41,474	41,507	41,541	41,575	41,609
366.4	41,643	41,677	41,711	41,745	41,779	41,813	41,846	41,881	41,915	41,948
366.5	41,983	42,017	42,051	42,085	42,119	42,153	42,187	42,221	42,255	42,289
366.6	42,324	42,358	42,392	42,426	42,460	42,495	42,529	42,563	42,597	42,632
366.7	42,666	42,700	42,735	42,769	42,803	42,838	42,872	42,906	42,941	42,975
366.8	43,010	43,044	43,078	43,113	43,147	43,182	43,216	43,251	43,285	43,320
366.9	43,354	43,389	43,423	43,458	43,493	43,527	43,562	43,596	43,631	43,665

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
367	43,700	43,735	43,769	43,804	43,839	43,873	43,908	43,943	43,978	44,012
367.1	44,047	44,082	44,117	44,151	44,186	44,221	44,256	44,291	44,325	44,360
367.2	44,395	44,430	44,465	44,500	44,535	44,569	44,604	44,639	44,674	44,709
367.3	44,744	44,779	44,814	44,849	44,884	44,919	44,954	44,989	45,024	45,059
367.4	45,094	45,129	45,164	45,199	45,235	45,270	45,305	45,340	45,375	45,410
367.5	45,445	45,480	45,516	45,551	45,586	45,621	45,656	45,692	45,727	45,762
367.6	45,797	45,833	45,868	45,903	45,939	45,974	46,009	46,045	46,080	46,115
367.7	46,151	46,186	46,221	46,257	46,292	46,328	46,363	46,398	46,434	46,469
367.8	46,505	46,540	46,576	46,611	46,647	46,682	46,718	46,754	46,789	46,825
367.9	46,860	46,896	46,931	46,967	47,003	47,038	47,074	47,110	47,145	47,181
368	47,217	47,252	47,288	47,324	47,360	47,395	47,431	47,467	47,503	47,538
368.1	47,574	47,610	47,646	47,682	47,718	47,753	47,789	47,825	47,861	47,897
368.2	47,933	47,969	48,005	48,041	48,077	48,113	48,149	48,184	48,221	48,257
368.3	48,293	48,329	48,365	48,401	48,437	48,473	48,509	48,545	48,581	48,617
368.4	48,653	48,690	48,726	48,762	48,798	48,834	48,870	48,907	48,943	48,979
368.5	49,015	49,052	49,088	49,124	49,161	49,197	49,233	49,270	49,306	49,342
368.6	49,379	49,415	49,451	49,488	49,524	49,561	49,597	49,634	49,670	49,707
368.7	49,743	49,779	49,816	49,853	49,889	49,926	49,962	49,999	50,035	50,072
368.8	50,109	50,145	50,182	50,218	50,255	50,292	50,328	50,365	50,402	50,439
368.9	50,475	50,512	50,549	50,586	50,622	50,659	50,696	50,733	50,770	50,806
369	50,843	50,880	50,917	50,954	50,991	51,028	51,065	51,102	51,138	51,175
369.1	51,212	51,249	51,286	51,323	51,360	51,397	51,434	51,472	51,509	51,546
369.2	51,583	51,620	51,657	51,694	51,731	51,768	51,806	51,843	51,880	51,917
369.3	51,954	51,991	52,029	52,066	52,103	52,141	52,178	52,215	52,252	52,290
369.4	52,327	52,364	52,402	52,439	52,477	52,514	52,551	52,589	52,626	52,664
369.5	52,701	52,739	52,776	52,813	52,851	52,888	52,926	52,964	53,001	53,039
369.6	53,076	53,114	53,151	53,189	53,227	53,264	53,302	53,340	53,377	53,415
369.7	53,453	53,491	53,528	53,566	53,604	53,642	53,679	53,717	53,755	53,793
369.8	53,831	53,868	53,906	53,944	53,982	54,020	54,058	54,096	54,134	54,172
369.9	54,210	54,248	54,286	54,324	54,362	54,400	54,438	54,476	54,514	54,552
370	54,590	54,628	54,666	54,704	54,743	54,781	54,819	54,857	54,895	54,933
370.1	54,972	55,010	55,048	55,086	55,125	55,163	55,201	55,240	55,278	55,316
370.2	55,355	55,393	55,431	55,470	55,508	55,546	55,585	55,623	55,662	55,700
370.3	55,739	55,777	55,816	55,854	55,893	55,931	55,970	56,008	56,047	56,086
370.4	56,124	56,163	56,202	56,240	56,279	56,318	56,356	56,395	56,434	56,472
370.5	56,511	56,550	56,589	56,627	56,666	56,705	56,744	56,783	56,822	56,860
370.6	56,899	56,938	56,977	57,016	57,055	57,094	57,133	57,172	57,211	57,250
370.7	57,289	57,328	57,367	57,406	57,445	57,484	57,523	57,562	57,601	57,641
370.8	57,680	57,719	57,758	57,797	57,836	57,876	57,915	57,954	57,993	58,033
370.9	58,072	58,111	58,151	58,190	58,229	58,269	58,308	58,347	58,387	58,426
371	58,466	58,505	58,544	58,584	58,623	58,663	58,702	58,742	58,781	58,821
371.1	58,861	58,900	58,940	58,979	59,019	59,059	59,098	59,138	59,178	59,217
371.2	59,257	59,297	59,337	59,376	59,416	59,456	59,496	59,535	59,575	59,615
371.3	59,655	59,695	59,735	59,775	59,815	59,855	59,894	59,934	59,974	60,014
371.4	60,054	60,094	60,135	60,175	60,215	60,255	60,295	60,335	60,375	60,415
371.5	60,455	60,496	60,536	60,576	60,616	60,656	60,697	60,737	60,777	60,817
371.6	60,858	60,898	60,938	60,979	61,019	61,059	61,100	61,140	61,181	61,221
371.7	61,261	61,302	61,342	61,383	61,423	61,464	61,504	61,545	61,586	61,626
371.8	61,667	61,707	61,748	61,788	61,829	61,870	61,910	61,951	61,992	62,033
371.9	62,073	62,114	62,155	62,196	62,237	62,277	62,318	62,359	62,400	62,441
372	62,482	62,523	62,563	62,604	62,645	62,686	62,727	62,768	62,809	62,850
372.1	62,891	62,932	62,974	63,015	63,056	63,097	63,138	63,179	63,220	63,262
372.2	63,303	63,344	63,385	63,426	63,468	63,509	63,550	63,592	63,633	63,674
372.3	63,716	63,757	63,798	63,840	63,881	63,923	63,964	64,005	64,047	64,089
372.4	64,130	64,172	64,213	64,255	64,296	64,338	64,379	64,421	64,463	64,504
372.5	64,546	64,588	64,629	64,671	64,713	64,754	64,796	64,838	64,880	64,922
372.6	64,963	65,005	65,047	65,089	65,131	65,173	65,215	65,257	65,299	65,341
372.7	65,383	65,425	65,467	65,509	65,551	65,593	65,635	65,677	65,719	65,761
372.8	65,803	65,845	65,888	65,930	65,972	66,014	66,056	66,099	66,141	66,183
372.9	66,226	66,268	66,310	66,353	66,395	66,437	66,480	66,522	66,565	66,607

Appendix A (continued)

Lake Tyler

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
373	66,650	66,692	66,735	66,777	66,820	66,862	66,905	66,947	66,990	67,033
373.1	67,075	67,118	67,161	67,203	67,246	67,289	67,332	67,374	67,417	67,460
373.2	67,503	67,546	67,588	67,631	67,674	67,717	67,760	67,803	67,846	67,889
373.3	67,932	67,975	68,018	68,061	68,104	68,147	68,190	68,233	68,276	68,320
373.4	68,363	68,406	68,449	68,492	68,535	68,579	68,622	68,665	68,709	68,752
373.5	68,795	68,839	68,882	68,925	68,969	69,012	69,056	69,099	69,142	69,186
373.6	69,230	69,273	69,317	69,360	69,404	69,447	69,491	69,535	69,578	69,622
373.7	69,666	69,709	69,753	69,797	69,841	69,884	69,928	69,972	70,016	70,060
373.8	70,104	70,147	70,191	70,235	70,279	70,323	70,367	70,411	70,455	70,499
373.9	70,543	70,587	70,632	70,676	70,720	70,764	70,808	70,852	70,897	70,941
374	70,985	71,029	71,073	71,118	71,162	71,206	71,251	71,295	71,340	71,384
374.1	71,429	71,473	71,517	71,562	71,607	71,651	71,696	71,740	71,785	71,829
374.2	71,874	71,919	71,963	72,008	72,053	72,097	72,142	72,187	72,232	72,276
374.3	72,321	72,366	72,411	72,456	72,501	72,546	72,591	72,636	72,681	72,726
374.4	72,771	72,816	72,861	72,906	72,951	72,996	73,041	73,086	73,131	73,177
374.5	73,222	73,267	73,312	73,358	73,403	73,448	73,494	73,539	73,584	73,630
374.6	73,675	73,721	73,766	73,812	73,857	73,903	73,948	73,994	74,039	74,085
374.7	74,131	74,176	74,222	74,268	74,313	74,359	74,405	74,450	74,496	74,542
374.8	74,588	74,634	74,680	74,725	74,771	74,817	74,863	74,909	74,955	75,001
374.9	75,047	75,093	75,140	75,186	75,232	75,278	75,324	75,370	75,417	75,463
375	75,509	75,555	75,602	75,648	75,694	75,741	75,787	75,833	75,880	75,926
375.1	75,973	76,019	76,066	76,112	76,159	76,206	76,252	76,299	76,345	76,392
375.2	76,439	76,486	76,532	76,579	76,626	76,673	76,720	76,766	76,813	76,860
375.3	76,907	76,954	77,001	77,048	77,095	77,142	77,189	77,236	77,284	77,331
375.4	77,378	77,425	77,472	77,519	77,567	77,614	77,661	77,709	77,756	77,803
375.5	77,851	77,898	77,946	77,993	78,041	78,088	78,136	78,184	78,231	78,279
375.6	78,327									

Appendix B

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD
AREA IN ACRES
ELEVATION INCREMENT IS ONE TENTH FOOT

January 2013 Survey
Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
337	0	0	0	0	0	0	0	0	0	0
337.1	0	0	0	0	0	0	0	0	0	0
337.2	0	0	0	0	0	0	0	0	0	0
337.3	0	0	0	0	0	0	0	0	0	0
337.4	0	0	0	0	0	0	0	0	0	0
337.5	0	0	0	0	0	0	0	0	0	0
337.6	0	0	0	0	0	0	0	0	0	0
337.7	0	0	0	0	0	0	0	0	0	0
337.8	0	0	0	0	0	0	0	0	0	0
337.9	0	0	0	0	0	0	0	0	0	0
338	0	0	0	0	0	0	0	0	0	0
338.1	1	1	1	1	1	1	1	1	1	1
338.2	1	1	1	1	1	1	1	1	1	1
338.3	2	2	2	2	2	2	2	2	2	2
338.4	2	2	2	2	2	2	2	3	3	3
338.5	3	3	3	3	3	3	3	3	3	3
338.6	3	4	4	4	4	4	4	4	4	4
338.7	4	5	5	5	5	5	5	5	6	6
338.8	6	6	6	6	6	7	7	7	7	7
338.9	7	8	8	8	8	8	8	9	9	9
339	9	9	10	10	10	10	10	11	11	11
339.1	11	11	12	12	12	12	13	13	13	13
339.2	14	14	14	15	15	15	16	16	16	17
339.3	17	17	18	18	18	19	19	20	20	20
339.4	21	21	21	22	22	22	23	23	23	24
339.5	24	24	24	25	25	25	26	26	26	27
339.6	27	27	28	28	28	29	29	29	30	30
339.7	30	30	31	31	31	32	32	32	33	33
339.8	34	34	35	35	35	36	36	36	37	37
339.9	38	38	39	39	39	40	40	41	41	41
340	42	42	43	43	44	44	45	45	46	46
340.1	47	47	48	48	49	49	49	50	50	51
340.2	51	52	52	53	53	53	54	54	55	55
340.3	56	56	57	58	58	59	59	60	60	61
340.4	61	62	63	63	64	64	65	66	66	67
340.5	68	68	69	70	71	71	72	73	74	75
340.6	76	77	78	79	80	82	83	84	85	85
340.7	86	87	88	89	90	91	91	92	93	94
340.8	95	95	96	97	98	99	100	101	102	102
340.9	103	104	105	106	107	108	109	110	111	112
341	113	114	115	115	116	117	118	119	120	121
341.1	121	122	123	124	125	126	127	128	129	130
341.2	131	132	133	134	135	136	137	138	139	139
341.3	140	141	142	143	144	145	145	146	147	148
341.4	149	150	151	152	152	153	154	155	156	157
341.5	158	159	159	160	161	162	163	163	164	165
341.6	166	167	167	168	169	170	171	172	172	173
341.7	174	175	176	177	178	179	180	181	181	182
341.8	183	184	185	186	187	188	190	191	192	193
341.9	194	195	197	198	199	200	201	202	203	204
342	205	206	207	208	209	210	211	212	213	215
342.1	216	217	218	219	220	221	222	224	225	226
342.2	227	228	230	231	232	234	235	236	238	239
342.3	240	241	243	244	245	246	248	249	250	251
342.4	252	254	255	256	257	258	260	261	262	263
342.5	264	265	266	267	268	269	270	271	272	273
342.6	274	275	276	277	278	279	281	282	283	284
342.7	285	287	288	289	290	291	292	293	295	296
342.8	297	298	299	301	302	303	304	306	307	308
342.9	309	310	312	313	314	315	316	317	319	320

Appendix B (continued)

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
343	321	322	323	324	325	326	327	328	329	330
343.1	331	332	333	334	335	336	337	338	339	340
343.2	341	342	343	344	345	346	347	348	349	350
343.3	351	352	352	353	354	355	356	357	358	359
343.4	359	360	361	362	363	364	364	365	366	367
343.5	368	369	370	371	372	372	373	374	375	376
343.6	377	378	379	380	381	381	382	383	385	386
343.7	387	388	388	389	390	391	392	393	394	395
343.8	396	397	398	399	400	401	402	403	404	405
343.9	406	407	407	408	409	410	411	412	414	415
344	416	417	418	419	420	420	421	422	423	424
344.1	425	426	427	428	429	430	431	432	433	434
344.2	435	436	437	438	439	440	441	442	443	444
344.3	444	445	446	447	448	449	450	450	451	452
344.4	453	454	455	455	456	457	458	459	459	460
344.5	461	462	462	463	464	465	466	466	467	468
344.6	469	469	470	471	472	472	473	474	474	475
344.7	476	477	478	478	479	480	481	482	482	483
344.8	484	485	486	487	487	488	489	490	491	492
344.9	493	494	495	495	496	497	498	499	500	501
345	501	502	503	504	504	505	506	507	508	508
345.1	509	510	511	511	512	513	514	514	515	516
345.2	517	517	518	519	520	521	521	522	523	524
345.3	524	525	526	527	528	528	529	530	531	531
345.4	532	533	534	535	535	536	537	538	539	540
345.5	541	541	542	543	544	545	545	546	547	548
345.6	549	549	550	551	552	553	554	554	555	556
345.7	557	558	559	560	560	561	562	563	564	565
345.8	566	567	568	569	570	571	572	573	574	575
345.9	576	577	578	579	580	581	582	583	584	585
346	586	587	588	590	591	592	593	595	596	597
346.1	598	599	601	602	603	604	606	607	608	609
346.2	610	611	612	614	615	616	617	618	619	620
346.3	621	622	623	624	625	626	627	628	629	630
346.4	631	632	634	635	636	637	638	639	640	641
346.5	642	643	644	645	646	647	648	649	650	651
346.6	652	653	654	655	656	657	658	659	660	661
346.7	663	664	665	666	667	668	669	670	671	673
346.8	674	675	676	677	678	680	681	682	683	685
346.9	686	687	689	690	691	692	694	695	696	697
347	698	700	701	702	703	704	706	707	708	709
347.1	710	711	712	714	715	716	717	718	720	721
347.2	722	723	724	725	727	728	729	730	731	732
347.3	733	734	735	736	737	738	739	741	742	743
347.4	744	745	746	747	748	748	749	750	751	752
347.5	753	755	756	757	758	759	760	761	762	763
347.6	764	765	766	767	768	770	771	772	773	775
347.7	776	777	778	780	781	782	784	785	787	788
347.8	789	791	792	793	795	796	797	799	800	801
347.9	803	804	806	807	809	810	811	813	814	816
348	817	819	820	822	823	825	826	827	829	830
348.1	832	833	835	836	838	839	840	842	843	845
348.2	846	848	849	851	852	854	855	857	858	860
348.3	861	863	864	865	867	868	870	871	872	874
348.4	875	877	878	880	881	882	884	885	887	889
348.5	890	892	893	895	896	898	899	901	902	904
348.6	905	907	908	910	911	912	914	915	917	918
348.7	920	921	923	924	926	927	929	930	932	933
348.8	935	937	938	940	941	943	945	946	948	949
348.9	951	953	954	956	957	959	960	962	964	965

Appendix B (continued)

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
349	967	969	970	972	974	975	977	979	980	982
349.1	983	984	986	987	988	990	991	993	994	995
349.2	997	998	1,000	1,001	1,002	1,004	1,005	1,006	1,008	1,009
349.3	1,010	1,012	1,013	1,014	1,016	1,017	1,018	1,019	1,021	1,022
349.4	1,023	1,024	1,026	1,027	1,028	1,029	1,030	1,031	1,033	1,034
349.5	1,035	1,036	1,037	1,039	1,040	1,041	1,042	1,043	1,045	1,046
349.6	1,047	1,048	1,049	1,050	1,051	1,052	1,053	1,055	1,056	1,057
349.7	1,058	1,059	1,060	1,061	1,062	1,063	1,064	1,066	1,067	1,068
349.8	1,069	1,070	1,071	1,073	1,074	1,075	1,076	1,077	1,079	1,080
349.9	1,081	1,082	1,083	1,085	1,086	1,087	1,088	1,089	1,090	1,091
350	1,092	1,093	1,094	1,095	1,096	1,097	1,098	1,099	1,100	1,101
350.1	1,102	1,103	1,104	1,105	1,106	1,106	1,107	1,108	1,109	1,110
350.2	1,111	1,112	1,113	1,114	1,115	1,115	1,116	1,117	1,118	1,119
350.3	1,120	1,121	1,122	1,123	1,123	1,124	1,125	1,126	1,127	1,128
350.4	1,129	1,129	1,130	1,131	1,132	1,133	1,134	1,135	1,136	1,137
350.5	1,138	1,139	1,140	1,141	1,142	1,143	1,144	1,145	1,146	1,147
350.6	1,148	1,149	1,150	1,151	1,152	1,153	1,154	1,155	1,156	1,157
350.7	1,158	1,159	1,160	1,161	1,162	1,162	1,163	1,164	1,165	1,166
350.8	1,167	1,168	1,169	1,170	1,171	1,172	1,173	1,174	1,175	1,176
350.9	1,177	1,178	1,179	1,180	1,181	1,183	1,184	1,185	1,186	1,187
351	1,188	1,189	1,190	1,191	1,192	1,193	1,194	1,196	1,197	1,198
351.1	1,199	1,200	1,201	1,202	1,203	1,205	1,206	1,207	1,209	1,210
351.2	1,211	1,213	1,214	1,215	1,216	1,218	1,219	1,220	1,221	1,222
351.3	1,224	1,225	1,226	1,227	1,229	1,230	1,232	1,233	1,235	1,236
351.4	1,238	1,239	1,241	1,243	1,244	1,246	1,247	1,249	1,250	1,252
351.5	1,253	1,255	1,256	1,258	1,259	1,261	1,262	1,264	1,265	1,267
351.6	1,268	1,270	1,271	1,272	1,274	1,275	1,276	1,278	1,279	1,281
351.7	1,282	1,284	1,285	1,286	1,288	1,289	1,290	1,292	1,293	1,294
351.8	1,296	1,297	1,298	1,300	1,301	1,302	1,303	1,305	1,306	1,307
351.9	1,309	1,310	1,311	1,313	1,314	1,315	1,317	1,318	1,319	1,321
352	1,322	1,324	1,325	1,326	1,328	1,329	1,331	1,332	1,333	1,335
352.1	1,336	1,337	1,339	1,340	1,341	1,343	1,344	1,345	1,347	1,348
352.2	1,349	1,351	1,352	1,353	1,354	1,356	1,357	1,358	1,359	1,361
352.3	1,362	1,363	1,364	1,365	1,367	1,368	1,369	1,371	1,372	1,373
352.4	1,374	1,375	1,377	1,378	1,379	1,380	1,382	1,383	1,384	1,386
352.5	1,387	1,388	1,390	1,391	1,392	1,394	1,395	1,397	1,398	1,399
352.6	1,401	1,402	1,403	1,405	1,406	1,408	1,409	1,411	1,413	1,414
352.7	1,416	1,417	1,419	1,420	1,422	1,423	1,425	1,426	1,428	1,430
352.8	1,431	1,433	1,434	1,435	1,437	1,438	1,440	1,441	1,443	1,444
352.9	1,446	1,447	1,448	1,450	1,451	1,453	1,454	1,455	1,456	1,458
353	1,459	1,460	1,462	1,463	1,464	1,465	1,467	1,468	1,469	1,471
353.1	1,472	1,473	1,474	1,476	1,477	1,478	1,479	1,481	1,482	1,483
353.2	1,484	1,486	1,487	1,488	1,490	1,491	1,492	1,494	1,495	1,496
353.3	1,497	1,499	1,500	1,502	1,503	1,504	1,506	1,507	1,508	1,510
353.4	1,511	1,513	1,514	1,515	1,517	1,518	1,520	1,521	1,523	1,524
353.5	1,526	1,527	1,528	1,530	1,531	1,533	1,534	1,536	1,537	1,538
353.6	1,540	1,541	1,543	1,544	1,546	1,547	1,549	1,550	1,552	1,553
353.7	1,555	1,556	1,558	1,559	1,561	1,562	1,564	1,565	1,567	1,569
353.8	1,570	1,572	1,573	1,575	1,576	1,578	1,580	1,581	1,583	1,584
353.9	1,586	1,588	1,589	1,591	1,593	1,594	1,596	1,597	1,599	1,600
354	1,602	1,603	1,605	1,607	1,608	1,610	1,611	1,613	1,614	1,616
354.1	1,617	1,619	1,620	1,622	1,623	1,625	1,626	1,628	1,629	1,631
354.2	1,632	1,634	1,635	1,637	1,638	1,640	1,641	1,643	1,644	1,646
354.3	1,647	1,648	1,650	1,651	1,653	1,654	1,656	1,657	1,658	1,660
354.4	1,661	1,663	1,664	1,666	1,667	1,669	1,670	1,672	1,673	1,674
354.5	1,676	1,677	1,679	1,680	1,682	1,683	1,684	1,686	1,687	1,688
354.6	1,690	1,691	1,692	1,694	1,695	1,697	1,698	1,699	1,701	1,702
354.7	1,703	1,705	1,706	1,707	1,709	1,710	1,712	1,713	1,714	1,716
354.8	1,717	1,718	1,720	1,721	1,722	1,724	1,725	1,726	1,728	1,729
354.9	1,730	1,732	1,733	1,734	1,735	1,737	1,738	1,739	1,741	1,742

Appendix B (continued)

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
355	1,743	1,744	1,746	1,747	1,748	1,749	1,751	1,752	1,753	1,754
355.1	1,756	1,757	1,758	1,759	1,761	1,762	1,763	1,764	1,766	1,767
355.2	1,768	1,769	1,771	1,772	1,773	1,774	1,775	1,777	1,778	1,779
355.3	1,780	1,781	1,783	1,784	1,785	1,786	1,788	1,789	1,790	1,791
355.4	1,793	1,794	1,795	1,796	1,798	1,799	1,800	1,801	1,803	1,804
355.5	1,805	1,807	1,808	1,809	1,810	1,812	1,813	1,814	1,816	1,817
355.6	1,818	1,820	1,821	1,822	1,824	1,825	1,826	1,828	1,829	1,831
355.7	1,832	1,834	1,835	1,836	1,838	1,839	1,841	1,842	1,844	1,845
355.8	1,847	1,848	1,850	1,851	1,853	1,854	1,856	1,857	1,858	1,860
355.9	1,861	1,863	1,864	1,866	1,867	1,868	1,870	1,871	1,873	1,874
356	1,876	1,877	1,879	1,880	1,882	1,883	1,885	1,886	1,888	1,889
356.1	1,891	1,892	1,894	1,896	1,897	1,899	1,900	1,902	1,904	1,905
356.2	1,907	1,908	1,910	1,912	1,913	1,915	1,917	1,918	1,920	1,922
356.3	1,923	1,925	1,927	1,929	1,930	1,932	1,934	1,935	1,937	1,939
356.4	1,940	1,942	1,944	1,945	1,947	1,949	1,950	1,952	1,954	1,956
356.5	1,957	1,959	1,961	1,963	1,965	1,966	1,968	1,970	1,972	1,973
356.6	1,975	1,977	1,978	1,980	1,981	1,983	1,985	1,986	1,988	1,990
356.7	1,991	1,993	1,995	1,997	1,998	2,000	2,002	2,003	2,005	2,007
356.8	2,009	2,011	2,013	2,015	2,017	2,019	2,021	2,023	2,025	2,027
356.9	2,028	2,030	2,032	2,034	2,036	2,037	2,039	2,041	2,043	2,044
357	2,046	2,048	2,049	2,051	2,053	2,054	2,056	2,058	2,059	2,061
357.1	2,063	2,064	2,066	2,068	2,069	2,071	2,072	2,074	2,076	2,077
357.2	2,079	2,080	2,082	2,084	2,086	2,087	2,089	2,091	2,093	2,094
357.3	2,096	2,098	2,100	2,101	2,103	2,105	2,106	2,108	2,110	2,112
357.4	2,113	2,115	2,117	2,118	2,120	2,122	2,123	2,125	2,127	2,129
357.5	2,130	2,132	2,134	2,136	2,138	2,139	2,141	2,143	2,144	2,146
357.6	2,148	2,150	2,151	2,153	2,155	2,157	2,159	2,161	2,163	2,164
357.7	2,166	2,168	2,169	2,171	2,173	2,174	2,176	2,178	2,179	2,181
357.8	2,182	2,184	2,186	2,187	2,189	2,190	2,192	2,194	2,195	2,197
357.9	2,198	2,200	2,201	2,203	2,204	2,206	2,208	2,209	2,211	2,212
358	2,214	2,215	2,217	2,218	2,220	2,221	2,223	2,224	2,226	2,227
358.1	2,229	2,231	2,232	2,234	2,235	2,237	2,238	2,240	2,241	2,243
358.2	2,244	2,246	2,247	2,249	2,250	2,252	2,253	2,255	2,256	2,258
358.3	2,259	2,260	2,262	2,263	2,265	2,266	2,268	2,269	2,270	2,272
358.4	2,273	2,275	2,276	2,278	2,279	2,281	2,282	2,283	2,285	2,286
358.5	2,288	2,289	2,290	2,292	2,293	2,295	2,297	2,298	2,300	2,301
358.6	2,303	2,304	2,306	2,307	2,309	2,310	2,312	2,313	2,315	2,316
358.7	2,317	2,319	2,320	2,322	2,324	2,325	2,327	2,328	2,330	2,331
358.8	2,333	2,334	2,336	2,337	2,339	2,341	2,342	2,344	2,345	2,347
358.9	2,349	2,350	2,352	2,353	2,355	2,356	2,358	2,359	2,361	2,362
359	2,363	2,365	2,366	2,368	2,369	2,371	2,372	2,374	2,375	2,377
359.1	2,378	2,379	2,381	2,382	2,383	2,385	2,386	2,388	2,389	2,390
359.2	2,392	2,393	2,394	2,396	2,397	2,398	2,400	2,401	2,402	2,404
359.3	2,405	2,406	2,408	2,409	2,410	2,412	2,413	2,414	2,415	2,416
359.4	2,418	2,419	2,420	2,421	2,423	2,424	2,425	2,426	2,428	2,429
359.5	2,430	2,431	2,433	2,434	2,435	2,436	2,438	2,439	2,440	2,442
359.6	2,443	2,444	2,446	2,447	2,448	2,450	2,451	2,452	2,454	2,455
359.7	2,457	2,458	2,459	2,461	2,462	2,463	2,465	2,466	2,468	2,469
359.8	2,471	2,472	2,474	2,475	2,477	2,478	2,480	2,482	2,483	2,485
359.9	2,486	2,488	2,490	2,492	2,493	2,495	2,496	2,498	2,499	2,501
360	2,502	2,504	2,505	2,507	2,508	2,509	2,511	2,512	2,514	2,515
360.1	2,516	2,518	2,519	2,521	2,522	2,523	2,525	2,526	2,527	2,529
360.2	2,530	2,531	2,533	2,534	2,535	2,537	2,538	2,539	2,541	2,542
360.3	2,543	2,545	2,546	2,547	2,549	2,550	2,551	2,553	2,554	2,555
360.4	2,557	2,558	2,560	2,561	2,562	2,564	2,565	2,566	2,568	2,569
360.5	2,571	2,572	2,574	2,575	2,577	2,578	2,580	2,581	2,583	2,584
360.6	2,585	2,587	2,588	2,590	2,591	2,593	2,594	2,596	2,597	2,599
360.7	2,600	2,602	2,603	2,605	2,606	2,608	2,609	2,610	2,612	2,613
360.8	2,614	2,616	2,617	2,618	2,620	2,621	2,623	2,624	2,625	2,627
360.9	2,628	2,630	2,631	2,632	2,634	2,635	2,637	2,638	2,639	2,641

Appendix B (continued)

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
361	2,642	2,643	2,645	2,646	2,647	2,649	2,650	2,651	2,653	2,654
361.1	2,655	2,657	2,658	2,659	2,661	2,662	2,663	2,665	2,666	2,668
361.2	2,669	2,670	2,672	2,673	2,674	2,676	2,677	2,678	2,680	2,681
361.3	2,682	2,684	2,685	2,687	2,688	2,690	2,691	2,693	2,694	2,695
361.4	2,697	2,698	2,700	2,701	2,703	2,705	2,706	2,708	2,709	2,711
361.5	2,713	2,714	2,716	2,717	2,719	2,720	2,722	2,723	2,724	2,726
361.6	2,727	2,729	2,730	2,731	2,733	2,734	2,736	2,737	2,738	2,740
361.7	2,741	2,742	2,744	2,745	2,746	2,748	2,749	2,751	2,752	2,753
361.8	2,755	2,756	2,757	2,759	2,760	2,762	2,763	2,765	2,766	2,767
361.9	2,769	2,770	2,771	2,773	2,774	2,775	2,777	2,778	2,779	2,781
362	2,782	2,783	2,785	2,786	2,787	2,789	2,790	2,791	2,793	2,794
362.1	2,795	2,797	2,798	2,799	2,801	2,802	2,803	2,805	2,806	2,807
362.2	2,808	2,810	2,811	2,812	2,814	2,815	2,816	2,817	2,819	2,820
362.3	2,821	2,823	2,824	2,825	2,827	2,828	2,829	2,831	2,832	2,833
362.4	2,835	2,836	2,838	2,839	2,841	2,842	2,843	2,844	2,846	2,847
362.5	2,848	2,849	2,851	2,852	2,853	2,855	2,856	2,857	2,859	2,860
362.6	2,861	2,863	2,864	2,865	2,867	2,868	2,869	2,871	2,872	2,873
362.7	2,875	2,876	2,877	2,879	2,880	2,881	2,883	2,884	2,885	2,887
362.8	2,888	2,889	2,891	2,892	2,893	2,894	2,896	2,897	2,898	2,899
362.9	2,901	2,902	2,903	2,904	2,906	2,907	2,908	2,910	2,911	2,913
363	2,914	2,916	2,917	2,918	2,920	2,921	2,923	2,924	2,925	2,927
363.1	2,928	2,930	2,931	2,932	2,934	2,935	2,937	2,938	2,940	2,941
363.2	2,943	2,944	2,946	2,947	2,948	2,949	2,951	2,952	2,953	2,955
363.3	2,956	2,958	2,959	2,960	2,962	2,963	2,965	2,966	2,967	2,969
363.4	2,970	2,972	2,973	2,974	2,976	2,977	2,978	2,980	2,981	2,982
363.5	2,984	2,985	2,987	2,988	2,989	2,991	2,992	2,993	2,995	2,996
363.6	2,997	2,999	3,000	3,001	3,002	3,003	3,005	3,006	3,007	3,008
363.7	3,010	3,011	3,012	3,013	3,014	3,015	3,017	3,018	3,019	3,020
363.8	3,021	3,023	3,024	3,025	3,026	3,027	3,029	3,030	3,031	3,032
363.9	3,034	3,035	3,036	3,037	3,038	3,039	3,040	3,041	3,043	3,044
364	3,045	3,046	3,047	3,049	3,050	3,051	3,053	3,054	3,055	3,056
364.1	3,058	3,059	3,060	3,061	3,063	3,064	3,065	3,066	3,068	3,069
364.2	3,070	3,071	3,073	3,074	3,075	3,076	3,077	3,079	3,080	3,081
364.3	3,083	3,084	3,085	3,087	3,088	3,089	3,091	3,092	3,093	3,094
364.4	3,096	3,097	3,098	3,100	3,101	3,102	3,104	3,105	3,106	3,108
364.5	3,109	3,111	3,112	3,113	3,115	3,116	3,118	3,120	3,121	3,123
364.6	3,124	3,126	3,128	3,129	3,131	3,133	3,135	3,137	3,139	3,141
364.7	3,142	3,144	3,146	3,148	3,149	3,151	3,153	3,155	3,156	3,158
364.8	3,159	3,161	3,163	3,164	3,166	3,167	3,169	3,170	3,172	3,174
364.9	3,175	3,177	3,178	3,180	3,182	3,183	3,185	3,186	3,188	3,189
365	3,190	3,192	3,193	3,195	3,196	3,198	3,199	3,200	3,202	3,203
365.1	3,204	3,206	3,207	3,208	3,210	3,211	3,212	3,213	3,215	3,216
365.2	3,217	3,219	3,220	3,221	3,223	3,224	3,225	3,227	3,228	3,230
365.3	3,231	3,233	3,234	3,236	3,237	3,239	3,240	3,242	3,243	3,245
365.4	3,247	3,248	3,250	3,252	3,253	3,255	3,257	3,258	3,260	3,261
365.5	3,263	3,264	3,266	3,268	3,269	3,270	3,272	3,273	3,274	3,276
365.6	3,277	3,279	3,280	3,281	3,283	3,284	3,285	3,287	3,288	3,289
365.7	3,291	3,292	3,293	3,295	3,296	3,298	3,299	3,300	3,302	3,303
365.8	3,305	3,306	3,308	3,309	3,311	3,312	3,313	3,315	3,316	3,317
365.9	3,319	3,320	3,322	3,323	3,324	3,326	3,327	3,328	3,329	3,331
366	3,332	3,334	3,335	3,336	3,338	3,339	3,341	3,342	3,344	3,345
366.1	3,346	3,348	3,350	3,351	3,353	3,355	3,357	3,358	3,360	3,361
366.2	3,363	3,364	3,366	3,367	3,368	3,369	3,371	3,372	3,373	3,375
366.3	3,376	3,377	3,378	3,380	3,381	3,383	3,384	3,385	3,387	3,388
366.4	3,389	3,391	3,392	3,393	3,395	3,396	3,398	3,399	3,400	3,402
366.5	3,403	3,405	3,406	3,408	3,409	3,410	3,412	3,413	3,415	3,416
366.6	3,417	3,419	3,420	3,421	3,423	3,424	3,425	3,426	3,428	3,429
366.7	3,430	3,431	3,433	3,434	3,435	3,436	3,437	3,438	3,439	3,441
366.8	3,442	3,443	3,444	3,445	3,446	3,447	3,449	3,450	3,451	3,452
366.9	3,453	3,454	3,456	3,457	3,458	3,459	3,460	3,461	3,462	3,463

Appendix B (continued)

Lake Tyler

RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
367	3,464	3,465	3,466	3,467	3,468	3,469	3,470	3,472	3,473	3,474
367.1	3,475	3,476	3,477	3,478	3,479	3,480	3,481	3,482	3,483	3,484
367.2	3,485	3,486	3,487	3,488	3,489	3,490	3,491	3,492	3,493	3,494
367.3	3,495	3,496	3,497	3,499	3,500	3,501	3,502	3,503	3,504	3,505
367.4	3,506	3,507	3,508	3,509	3,510	3,511	3,512	3,513	3,514	3,515
367.5	3,516	3,517	3,518	3,519	3,520	3,521	3,523	3,524	3,525	3,526
367.6	3,527	3,528	3,529	3,530	3,531	3,532	3,533	3,534	3,535	3,536
367.7	3,537	3,538	3,540	3,541	3,542	3,543	3,544	3,545	3,546	3,547
367.8	3,548	3,549	3,550	3,551	3,552	3,553	3,554	3,556	3,557	3,558
367.9	3,559	3,560	3,561	3,562	3,563	3,564	3,565	3,566	3,567	3,569
368	3,570	3,571	3,572	3,573	3,574	3,575	3,576	3,577	3,578	3,580
368.1	3,581	3,582	3,583	3,584	3,585	3,586	3,587	3,588	3,590	3,591
368.2	3,592	3,593	3,594	3,595	3,596	3,597	3,599	3,600	3,601	3,602
368.3	3,603	3,604	3,605	3,607	3,608	3,609	3,610	3,611	3,612	3,613
368.4	3,615	3,616	3,617	3,618	3,619	3,620	3,621	3,623	3,624	3,625
368.5	3,626	3,627	3,628	3,630	3,631	3,632	3,633	3,634	3,635	3,637
368.6	3,638	3,639	3,640	3,641	3,642	3,644	3,645	3,646	3,647	3,648
368.7	3,650	3,651	3,652	3,653	3,654	3,655	3,657	3,658	3,659	3,660
368.8	3,661	3,663	3,664	3,665	3,666	3,667	3,669	3,670	3,671	3,672
368.9	3,673	3,675	3,676	3,677	3,678	3,679	3,681	3,682	3,683	3,684
369	3,685	3,687	3,688	3,689	3,690	3,691	3,693	3,694	3,695	3,696
369.1	3,697	3,699	3,700	3,701	3,702	3,703	3,705	3,706	3,707	3,708
369.2	3,709	3,711	3,712	3,713	3,714	3,716	3,717	3,718	3,719	3,720
369.3	3,722	3,723	3,724	3,725	3,727	3,728	3,729	3,730	3,731	3,733
369.4	3,734	3,735	3,736	3,738	3,739	3,740	3,741	3,743	3,744	3,745
369.5	3,746	3,748	3,749	3,750	3,751	3,753	3,754	3,755	3,756	3,758
369.6	3,759	3,760	3,761	3,763	3,764	3,765	3,766	3,768	3,769	3,770
369.7	3,771	3,773	3,774	3,775	3,776	3,778	3,779	3,780	3,782	3,783
369.8	3,784	3,785	3,787	3,788	3,789	3,791	3,792	3,793	3,794	3,796
369.9	3,797	3,798	3,799	3,801	3,802	3,803	3,805	3,806	3,807	3,808
370	3,810	3,811	3,812	3,814	3,815	3,816	3,818	3,819	3,820	3,821
370.1	3,823	3,824	3,825	3,827	3,828	3,829	3,830	3,832	3,833	3,834
370.2	3,836	3,837	3,838	3,840	3,841	3,842	3,844	3,845	3,846	3,847
370.3	3,849	3,850	3,851	3,853	3,854	3,855	3,857	3,858	3,859	3,861
370.4	3,862	3,863	3,865	3,866	3,867	3,869	3,870	3,871	3,873	3,874
370.5	3,875	3,877	3,878	3,879	3,881	3,882	3,883	3,885	3,886	3,887
370.6	3,889	3,890	3,891	3,893	3,894	3,895	3,897	3,898	3,899	3,901
370.7	3,902	3,903	3,905	3,906	3,907	3,909	3,910	3,911	3,913	3,914
370.8	3,916	3,917	3,918	3,920	3,921	3,922	3,924	3,925	3,926	3,928
370.9	3,929	3,931	3,932	3,933	3,935	3,936	3,938	3,939	3,940	3,942
371	3,943	3,945	3,946	3,947	3,949	3,950	3,952	3,953	3,955	3,956
371.1	3,957	3,959	3,960	3,962	3,963	3,965	3,966	3,968	3,969	3,971
371.2	3,972	3,974	3,975	3,976	3,978	3,979	3,981	3,982	3,984	3,985
371.3	3,987	3,988	3,990	3,991	3,993	3,994	3,995	3,997	3,998	4,000
371.4	4,001	4,003	4,004	4,006	4,007	4,009	4,010	4,012	4,013	4,015
371.5	4,016	4,017	4,019	4,020	4,022	4,023	4,025	4,026	4,028	4,029
371.6	4,031	4,032	4,034	4,035	4,036	4,038	4,039	4,041	4,042	4,044
371.7	4,045	4,047	4,048	4,050	4,051	4,053	4,054	4,056	4,057	4,059
371.8	4,060	4,062	4,063	4,065	4,066	4,068	4,069	4,071	4,072	4,074
371.9	4,075	4,077	4,078	4,080	4,081	4,083	4,084	4,086	4,087	4,089
372	4,090	4,092	4,093	4,095	4,096	4,098	4,099	4,101	4,102	4,104
372.1	4,105	4,107	4,108	4,110	4,111	4,113	4,114	4,116	4,117	4,119
372.2	4,121	4,122	4,124	4,125	4,127	4,128	4,130	4,131	4,133	4,134
372.3	4,136	4,138	4,139	4,141	4,142	4,144	4,145	4,147	4,148	4,150
372.4	4,152	4,153	4,155	4,156	4,158	4,159	4,161	4,163	4,164	4,166
372.5	4,167	4,169	4,170	4,172	4,174	4,175	4,177	4,178	4,180	4,182
372.6	4,183	4,185	4,186	4,188	4,190	4,191	4,193	4,194	4,196	4,198
372.7	4,199	4,201	4,202	4,204	4,206	4,207	4,209	4,211	4,212	4,214
372.8	4,215	4,217	4,219	4,220	4,222	4,224	4,225	4,227	4,229	4,230
372.9	4,232	4,233	4,235	4,237	4,238	4,240	4,242	4,243	4,245	4,247

Appendix B (continued)

Lake Tyler

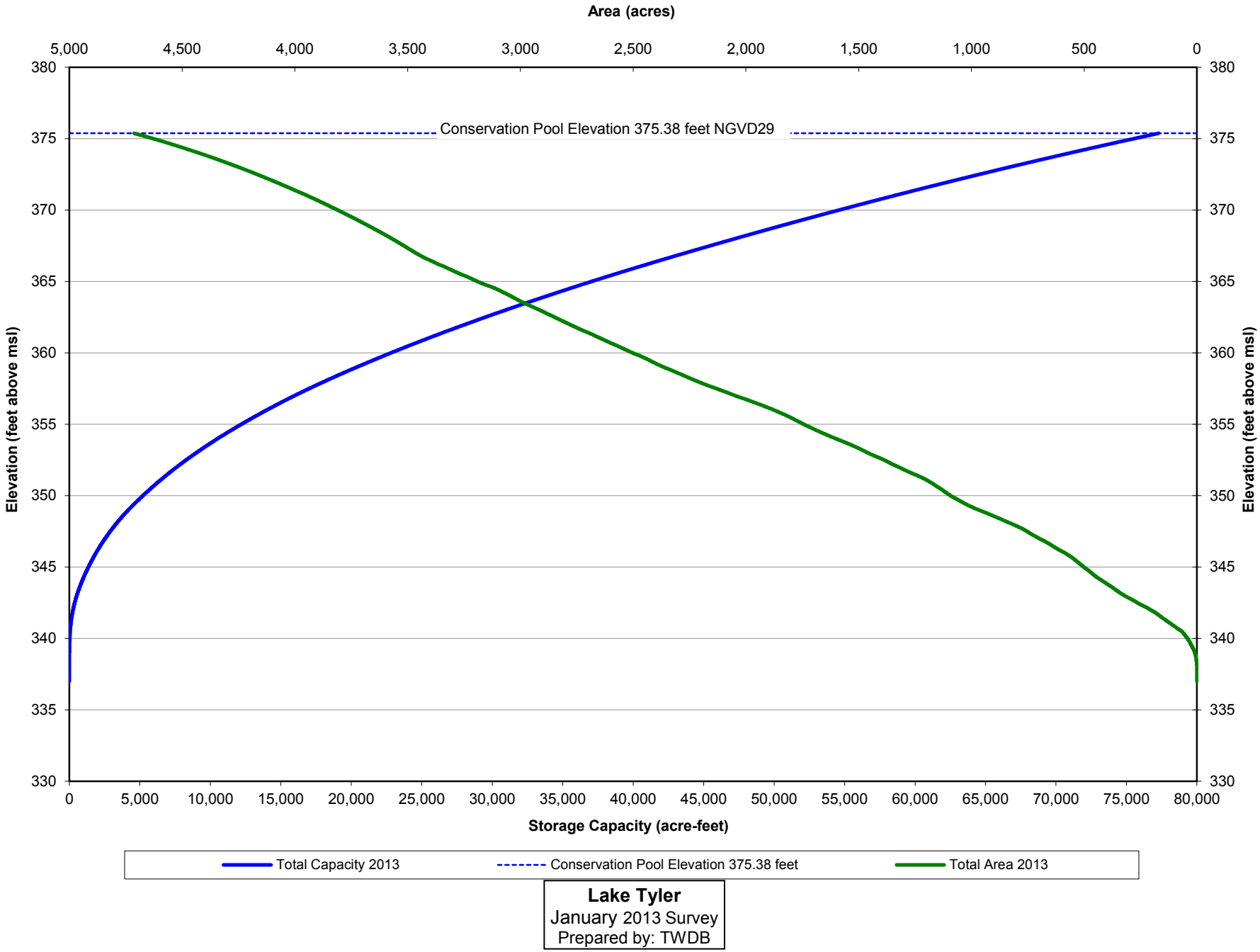
RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — January 2013 Survey

AREA IN ACRES — Conservation Pool Elevation 375.38 feet (NGVD29)

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
373	4,248	4,250	4,252	4,253	4,255	4,257	4,258	4,260	4,262	4,264
373.1	4,265	4,267	4,269	4,270	4,272	4,274	4,275	4,277	4,279	4,281
373.2	4,282	4,284	4,286	4,287	4,289	4,291	4,293	4,294	4,296	4,298
373.3	4,299	4,301	4,303	4,305	4,306	4,308	4,310	4,312	4,313	4,315
373.4	4,317	4,319	4,320	4,322	4,324	4,326	4,327	4,329	4,331	4,333
373.5	4,334	4,336	4,338	4,340	4,342	4,343	4,345	4,347	4,349	4,350
373.6	4,352	4,354	4,356	4,358	4,359	4,361	4,363	4,365	4,367	4,368
373.7	4,370	4,372	4,374	4,376	4,378	4,379	4,381	4,383	4,385	4,387
373.8	4,389	4,390	4,392	4,394	4,396	4,398	4,400	4,401	4,403	4,405
373.9	4,407	4,409	4,411	4,413	4,414	4,416	4,418	4,420	4,422	4,424
374	4,426	4,428	4,429	4,431	4,433	4,435	4,437	4,439	4,441	4,443
374.1	4,445	4,447	4,448	4,450	4,452	4,454	4,456	4,458	4,460	4,462
374.2	4,464	4,466	4,468	4,470	4,472	4,473	4,475	4,477	4,479	4,481
374.3	4,483	4,485	4,487	4,489	4,491	4,493	4,495	4,497	4,499	4,501
374.4	4,503	4,505	4,507	4,509	4,511	4,513	4,515	4,517	4,519	4,521
374.5	4,523	4,525	4,527	4,529	4,531	4,533	4,535	4,537	4,539	4,541
374.6	4,543	4,545	4,547	4,549	4,551	4,553	4,555	4,557	4,559	4,562
374.7	4,564	4,566	4,568	4,570	4,572	4,574	4,576	4,578	4,580	4,582
374.8	4,584	4,587	4,589	4,591	4,593	4,595	4,597	4,599	4,601	4,603
374.9	4,606	4,608	4,610	4,612	4,614	4,616	4,618	4,621	4,623	4,625
375	4,627	4,629	4,632	4,634	4,636	4,638	4,640	4,643	4,645	4,647
375.1	4,649	4,651	4,654	4,656	4,658	4,660	4,663	4,665	4,667	4,669
375.2	4,672	4,674	4,676	4,679	4,681	4,683	4,686	4,688	4,690	4,693
375.3	4,695	4,697	4,700	4,702	4,704	4,707	4,709	4,711	4,714	4,716
375.4	4,719	4,721	4,724	4,726	4,729	4,731	4,734	4,736	4,739	4,741
375.5	4,744	4,746	4,749	4,751	4,754	4,757	4,759	4,762	4,765	4,767
375.6	4,853									



Lake Tyler
January 2013 Survey
Prepared by: TWDB

Figure 6

Contours

(feet above mean sea level)

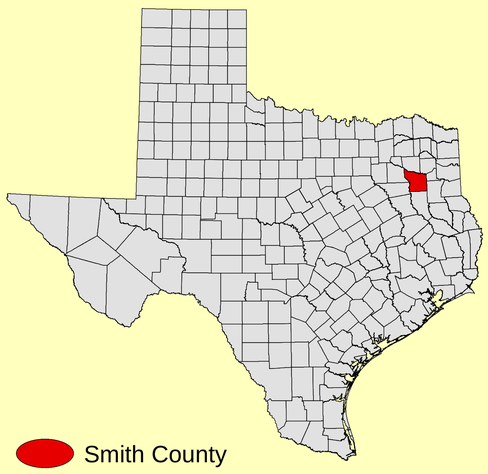
375
370
365
360
355
350
345
340

Lake Tyler elevation
375.6 feet NGVD29

Islands

Conservation pool elevation
375.38 feet NGVD29

Projection: NAD83
State Plane Texas
North Central Zone (feet)



Smith County

This map is the product of a survey conducted by the Texas Water Development Board's Hydrographic Survey Program to determine the capacity of Lake Tyler. The Texas Water Development Board makes no representations nor assumes any liability.

Lake Tyler

5' - contour map

N

3,000,000
3,010,000
3,020,000
6,810,000
6,800,000
6,790,000
6,780,000

0 0.5 1 2 Miles

Texas Water Development Board

January 2013 Survey